APPENDIX G
BEST MANAGEMENT PRACTICES AND CONSERVATION MEASURES

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INTRODUCTION

This appendix provides a list of best management practices (BMPs) that are applicable to land use activities authorized by the Colorado River Valley Field Office (CRVFO). Best management practices are state-of-the-art mitigation measures that may be applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts of land use activities. The BMPs included in this resource management plan (RMP) are not intended to be a complete list but are displayed to show land use project proponents examples of commonly used practices the CRVFO may require to reduce impacts of surface-disturbing activities, use or occupancy. More explicit best management practices based on local conditions and resource-specific concerns could be developed once a specific proposal is being evaluated through the environmental analysis process. Additional best management practices can be proposed by project applicants for activities on BLM lands.

BMP's are intended to be implemented in a timely manner and maintained as appropriate to ensure effectiveness. Monitoring will help to refine and clarify whether the BMPs are achieving the goals and objectives of this resource management plan. If through inspection or routine maintenance a BMP is found to not be working as intended the BLM can consider other BMP's to achieve the planned desired results of the land use action.

BMPs may also adaptively change overtime, being updated in response to monitoring or changing resource conditions or revised documents/guidance. As new technologies and methodologies arise, the BMP list may expand to provide for additional proven means of reducing impacts. Conversely, if shown to be ineffective select BMP's may not be implemented.

BEST MANAGEMENT PRACTICES

AIR QUALITY

Air quality standards are governed by the Clean Air Act of 1990 (as amended) (42 United States [US] Code Chapter 85). The US Environmental Protection Agency is charged with setting National Ambient Air Quality Standards, currently found at http://www.epa.gov/air/criteria.html (US Environmental Protection Agency 2009). The EPA's voluntary STAR program keeps a comprehensive list of air quality BMPs related to oil and gas development on the website http://www.epa.gov/gasstar/index.html. At the state level, the Colorado Department of Public Health and Environment has established its standards (Colorado Department of Public Health and Environment 2009). The Intermountain Oil and Gas BMP Project is based in Colorado and the website contains comprehensive BMPs including air quality BMPs http://www.oilandgasbmps.org/browse.php?cat=1.

AIR-1: The BLM has the authority and responsibility under the Federal Land Policy and Management Act to manage public lands in a manner that will protect the quality of air and atmospheric values. Therefore, the BLM may manage the pace, place, density, and intensity of leasing and development to meet air quality goals.

AIR-2: The proponent of a project will be required to minimize air pollutant emissions by complying with all applicable state and federal regulations (including application of best available control technology) and may be required to apply mitigation including but not limited to best management practices, and other control technologies or strategies identified by the BLM or CDPHE in accordance with delegated regulatory authority.

AIR-3: The BLM may require project proponents for oil and gas development projects to conduct pre-construction air monitoring within or adjacent to the proposed development area. The purpose of this monitoring is to establish baseline air quality conditions prior to development at the site. The requirement for monitoring will be determined by BLM based on the absence of existing monitoring; existing air quality conditions; magnitude of potential air emissions from the project or activity; magnitude of existing emission sources in the area; proximity to a federally mandated Class I area, sensitive Class II area, or population center; location within a non-attainment or maintenance area; meteorologic or geographic conditions; project duration; or issues identified during project scoping. The project proponent will be required to provide a minimum of one year of baseline ambient air monitoring data for any pollutant(s) of concern as determined by BLM. If BLM determines that baseline monitoring is required, this pre-analysis data must meet CDPHE air monitoring standards, be obtained from a site within 50 km of the project boundary, and cover the year immediately prior to the proposed project submittal. The project proponent will be responsible for siting, installing, operating, and maintaining any required air monitoring.

AIR-4: The BLM may require project proponents for oil and gas development projects to conduct air monitoring for the life of the oil and gas development project depending on the magnitude of potential air emissions from the project or activity, proximity to a federally mandated Class I area, sensitive Class II area, or population center, location within a non-attainment or maintenance area, meteorologic or geographic conditions, existing air quality conditions, magnitude of existing development in the area, or issues identified during project scoping. The purpose of this air monitoring is to determine impacts attributable to the project over time. The project proponent will be responsible for siting, installing, operating, and maintaining any required air monitoring.

AIR-5: The BLM may require a project proponent to conduct air quality modeling for any pollutant(s) of concern in the absence of sufficient data to ensure compliance with laws and regulations or to determine the effectiveness of mitigation options, unless the project proponent can demonstrate that the project will result in no net increase in emissions of the pollutant(s) of concern. The requirement for modeling will be based on existing air quality conditions; magnitude of potential air emissions from the project or activity; magnitude of existing emission sources in the area; proximity to a federally mandated Class I area, sensitive Class II area, an area expected to exceed a NAAQs or PDS increment, population center, location within a non-attainment or maintenance area; meteorologic or geographic conditions; project duration; or issues identified during project scoping. The BLM, in cooperation with an interagency review team, will determine the parameters for the modeling analysis through the development of a project specific modeling protocol.

AIR-6: The BLM may require project proponents for oil and gas development projects to submit a contingency plan that provides for reduced operations in the event of an air quality episode. Specific operations and pollutants to be addressed in the contingency plan will be determined by the BLM on a case-by-case basis taking into account existing air quality and pollutants emitted by the project.

AIR -7: Implement directional drilling techniques to reduce construction related emissions (dust and vehicle and construction equipment emissions).

AIR -8: Improve engine technology (Tier 2 or better) for diesel drill rig engines to reduce NOx, PM, CO, and VOC emissions.

AIR -9: Utilize natural gas fired drill rig engines to reduce NOx emissions and reduce formation of visibility impairing compounds and ozone.

A-10: Improve engine technology (Tier 2 or better) for all mobile and non-road diesel engines to reduce NOx, PM, CO, and VOC emissions.

AIR -11: Utilize "Green completion" (a.k.a. closed loop or flareless) technology to reduce VOC and CH4 emissions. This would also reduce or eliminate open pits and associated evaporative emissions.

AIR -12: Utilize "Green workovers" to reduce VOC and CH4 emissions. This would also reduce or eliminate open pits and associated evaporative emissions.

AIR -13: Eliminate evaporation pits for drilling fluids to reduce VOC and GHG emissions.

AIR -14: Electrification of wellhead compression/pumping to reduce local emissions of fossil fuel combustion and transfers to a more easily controlled source.

AIR -15: Utilize renewable power sources to provide energy for compressors, monitoring equipment, or pumps.

AIR -16: Replace wet compressor seals with dry seals or use mechanical seals to reduce gas venting (VOC and GHG emissions).

AIR -17: Centralize or consolidate gas processing facilities, liquids gathering systems (condensate and produced water), water and/or fracturing liquids delivery systems, to reduce VOC and GHG emissions from individual dehydration/separator units and to reduce vehicle emissions.

AIR -18: Eliminate the use of open top tanks to reduce VOC and GHG emissions.

A-19: Improve capture and control of flashing emissions from all storage tanks and separation vessels with vapor recovery and/or thermal combustion units.

AIR -20: Improve capture and control of produced water, crude oil, and condensate tank emissions to reduce VOC and GHG emissions.

AIR -21: Improve capture and control of dehydration equipment emissions with condensers, vapor recovery, and/or thermal combustion to reduce VOC, HAP, and GHG emissions.

AIR -22: Use zero emissions dehydrators or use desiccants dehydrators to reduce VOC, HAP, and GHG emissions.

AIR -23: Reduce miscellaneous fugitive VOC emissions by

a) Installing plunger lift systems to reduce well blow downs
b) Install and maintain low VOC emitting seals, valves, and hatches on production equipment.
c) Initiate equipment leak detection and repair program (e.g., including use of FLIR infrared cameras, grab samples, organic vapor detection devices, and/or visual inspection).
d) Install or convert Gas operated pneumatic devices to electric, solar, or instrument (or compressed) air driven devices/controllers.
e) Use "low" or "no bleed" gas operated pneumatic devices/controllers.
f) Use closed loop system or thermal combustion for gas operated pneumatic pump emissions.
g) Install or convert gas operated pneumatic pumps to electric, solar, or instrument (or compressed) air driven pumps.
h) Install vapor recovery on truck loading/unloading operations at tanks.

AIR -24: Utilize dust suppression techniques on unpaved surfaces including watering, chemical suppressants, and gravel.

AIR -25: Utilize remote telemetry and automation of wellhead equipment to reduce vehicle traffic and associated emissions.

AIR -26: Post and enforce speed limits to reduce air borne fugitive dust from vehicular traffic on unpaved roads.

AIR -27: Reduce commuter vehicle trips through car pools, commuter vans or buses, innovative work schedules, or work camps.

AIR -28: Use ultra-low sulfer diesel (e.g. in engines, compressors, construction equipment) to reduce emissions of particulates and sulfates.

AIR -29: Utilize best available technology and methods to degasify coal seams prior to mining. Capture methane gas from coal seams to obtain a market income. Modify methane drainage over time to ensure capture is optimal.

AIR -30: Reduce unnecessary vehicle idling to reduce combustion emissions, ozone formation, visibility impacts, and fuel consumption.

AIR -31: Reduce the pace of (phased) development to reduce the peak emissions of all pollutants.

AIR -32: Restrict surface disturbing activities to periods when wind speeds are less than 25 mph.

AIR -33: Keep soil and coal refuse moist while loading into dump trucks.

AIR -34: Keep soil and coal refuse loads below the freeboard of the truck.

AIR -35: Minimize drop heights when loaders dump soil and coal refuse into trucks.

AIR -36: Tighten gate seals on dump trucks.

AIR -37: Cover dump trucks before traveling on public roads.

AIR -38: Cover construction materials, stockpiled soils, and stockpiled coal refuse if they are a source of fugitive dust.

AIR -39: Train workers to handle construction materials and debris to reduce fugitive emissions.

AIR -40: Employ water injection or rotoclones on all overburden drills.

AIR -41: Use chutes, drapes, or other means to enclose conveyor transfer points, screens, and crushers; cover all conveyors.

AIR -42: Suppress and extinguish spoil and coal fires as soon as is reasonable and safely possible.

AIR -43: Cooperate with the Colorado Department of Public Health and Environment and local governments in identifying monitoring needs, as well as in facilitating installation and operation of air quality monitoring equipment on BLM land or in conjunction with BLM authorized activities.

References:

Colorado Department of Public Health and Environment. 2011. Air Quality Control Commission Regulations. Internet Web site: http://www.cdphe.state.co.us/regulations/airregs. Accessed on May 21, 2011.

Bureau of Land Management. 2009. Air Quality BMPs-Best Management Practices for Fluid Minerals. Updated 8-24-2009. www.blm.gov/bmp.

US Environmental Protection Agency. 2009. National Ambient Air Quality Standards. Internet Web site: http://www.epa.gov/air/criteria.html. Accessed on October 14, 2009.

SOILS

SOI-1: All routes shall be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features (BLM 2012) or where appropriate BLM Manual Section 9115 standards for primitive roads (BLM 2012b). For drainage crossings, culverts should be sized for the 50 year storm event with no static head and to pass a 100-year event without failing. Site specific conditions may warrant BLM to require designs for larger events (e.g. 75-100 year storm events). Large culverts and bridges shall be designed and constructed per BLM Manual 9112 (large culverts and bridges) (BLM 2009). Large culverts and bridges shall be designed to pass a 100-year storm event (minimum).

SOI-2: When saturated soil conditions existing on access roads or location, or when road rutting becomes deeper than 3 inches, construction shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils, roads and locations.

SOI -3: Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or seeding.

SOI -4: Topsoil shall only be used for reclamation and shall not be used as fill or to bed or pad the pipe during backfilling.

SOI -5: Topsoil stripping will include all growth medium present at a site (following initial clearing of large trees, etc,...), as indicated by color or texture. Stripping and storage depth may be specified during the onsite inspection. All stripped topsoil /growth medium will be salvaged, segregated and stored in a manner that extends biological viability and protects it from loss. Topsoil and all growth medium will be replaced prior to seedbed preparation. No topsoil will be stripped or segregated when soils are saturated or frozen below the stripping depth.

SOI -6: A Winter Construction Plan will be submitted and approved by the BLM Authorized Officer before a Notice to Proceed will be authorized for construction activities in frozen soils.

SOI -7: Prohibit placing fill on a frozen foundation.

SOI -8: Slopes shall not be created so close to property lines as to endanger adjoining properties without adequate protection against sedimentation, erosion, slippage, settlement, subsidence or other related damages.

SOI -9: Surface disturbing actions will be sensitive to natural resource protection. When surface disturbance in sensitive areas is unavoidable, they will be minimized to the greatest extent practicable, especially near drainage features and on soils mapped as being saline.

SOI -10: Surface disturbing actions associated with development of fluid minerals will follow Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (commonly referred to as The Gold Book)(BLM 2007b).

SOI -11: As detailed in the site plan for surface water management, drainage from disturbed areas will be confined or directed to minimize erosion, particularly within 100 feet of all drainages. No runoff, including that from roads, will be allowed to flow into intermittent or perennial waterways without first passing through sediment-trapping mechanisms such as vegetation, anchored bales or catchments.

SOI -12: Standard secondary containment shall hold 110% of the capacity the largest single tank it contains and be impervious to any oil, glycol, produced water, or other toxic fluid for 72 hours. Earthen berms must be compacted and of fine material that will prevent seepage of any spill to surrounding area.

SOI -13: All tanks with a capacity of ten (10) barrels or greater shall be labeled or posted with the following information: A. Name of operator; B. Operator's emergency contact telephone number; C. Tank capacity; D. Tank contents; and E. National Fire Protection Association (NFPA) Label. Smaller chemical storage shall be labeled with contents and NFPA label.

SOI -14: Interim and final reclamation procedures shall utilize best available science and technology to protect natural resources from undue degradation.

SOI -15: To limit surface disturbance and associated impacts to natural resources, all actions will consider the character of the topography and landform. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Rights-of-way will be shared, and structures and facilities will be grouped.

SOI -16: Consider site specific soil and vegetative characteristics and reclamation potential in project design and layout.

SOI -17: Native vegetation and soils will be protected and disturbance to them will be minimized.

SOI -18: Cleared vegetation smaller than four inches in diameter will be stockpiled, shredded, and salvaged with topsoil. Cleared vegetation larger than four inches in diameter will be scattered over disturbed areas to accomplish reclamation objectives. Excessive vegetation larger than four inches in diameter may be removed from public land or shredded in place to be salvaged with topsoil. A wood cutting permit may be purchased from BLM for material removed from the site.

SOI -19: Windrowing of Topsoil. *[Use where appropriate based on topography – may not be appropriate for pads in steep areas or where pad size should be minimized.]* Topsoil shall be windrowed around the perimeter of surface disturbance to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil. Topsoil shall also be windrowed, segregated, and stored along disturbed surfaces or linear features for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.

SOI -20: Where applicable, entrances to construction locations will be covered by gravel "track pads" to prevent sediment and weed seeds from being tracked in and out of the site.

SOI -21: In areas where all weather access is necessary, the operator would construct and maintain all-weather routes per BLM Manual Section 9113 standards. Graveling or other appropriate surfacing material would be required to reduce environmental resource damage and provide safe all-weather access.

SOI -22: Specialized low surface impact equipment (wide- or balloon-tired vehicles, all-terrain vehicles) or helicopters may be used for activities in off-road areas to protect fragile soils and or other resource values.

SOI -23: Standard secondary containment shall include a study corrugated metal wall to create a basin, be lined with a heavy impervious poly liner and be protected with a gravel surface. Small plastic hoppers shall be installed at all loadout connections to catch drips and small leaks.

SOI -24: Oil and gas pads will be tear-dropped in shape to maximize interim reclamation and minimize bare soils. Infrastructure must be clustered appropriately on the pad to facilitate the smallest disturbance footprint possible.

References:

BLM. 2009. H-9112-1 Bridges and Major Culverts Handbook. Bureau of Land Management, Washington, D.C.

BLM. 2012. H-9113-1 Road Design Handbook. Bureau of Land Management, Washington, D.C. On-line: http://web.blm.gov/nstc/eat/pdf/Final%20H-9113-1.pdf

BLM. 2012b. H-9115 Primitive Roads Manual. Bureau of Land Management, Washington, D.C.

United States Department of the Interior and United States Department of Agriculture. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

WATER RESOURCES

WTR-1: The operator/permittee shall adhere to all requirements under the Federal Water Pollution Control Act, as amended through P.L. 107-303, November 27, 2002.

WTR-2: For surface disturbing activities exceeding one acre in size, develop and implement Stormwater Pollution Prevention Plans to include site-specific design, systematic site monitoring, installation of run-on/off controls such as ditches or berms and installation of adaptive BMPs to reduce potential erosion and sediment production and transport. Stormwater will be dispersed to stabilized areas to slow velocity, prevent erosion and support infiltration into soils. Stormwater BMPs identified in the State approved Storm Water Pollution Prevention Plan shall be in place prior to any earth-disturbing activity. Additional BMPs will be installed if determined necessary by the BLM. All measures shall be maintained in good, functional condition. All temporary BMPs shall be removed once site stabilization and reclamation efforts have been deemed successful by the BLM.

WTR-3: All stream crossings affecting perennial streams or streams supporting riparian habitat shall be professionally engineered (design, construction, and maintenance).

WTR-4: Spoil material from clearing, grubbing, and channel excavation shall be disposed of in a manner that will not interfere with the function of the channel and in accordance with all local, state, and federal laws and regulations.

WTR-5: Surface disturbing actions associated with development of fluid minerals will follow Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (commonly referred to as The Gold Book BLM 2007b).

WTR-6: Before activities take place, every pad, access road, or facility site will have an approved surface drainage plan for establishing positive management of surface water drainage, to reduce erosion and sediment transport. The drainage plan will include adaptive BMPs, monitoring, maintenance and reporting. BMPs may include run-on/run-off controls such as surface pocking or re-vegetation, ditches or berms, basins, and other control methods to reduce erosion. Pre-construction drainage BMPs will be installed as appropriate.

WTR-7: The operator will reduce potential for contaminating water resources where spills of drilling fluids are most vulnerable. Areas of vulnerability will include a 0.25 mile buffer around the following: mapped alluvial, colluvial, and glacial deposits; springs and perennial water sources, Source Water Protection Areas, and Municipal Watersheds). In these areas, the operator will utilize:

a. Closed loop drilling systems.
b. Gas-blocker additives will utilized during the cementing process.
c. Flowback and stimulation fluids will be contained in tanks on well pad with secondary containment mats/blankets (or equivalent).
d. Containment devices shall be installed beneath and around crude oil, condensate and produced water storage tanks.
e. The operator will collect baseline water quality data from downstream fresh water sources prior to drilling, mining, or storage of potentially harmful substances. Parameters to be analyzed will be determined on a site specific basis based on the nature of the proposed action. The operator will be responsible for submitting a list of parameters to BLM for approval prior to sampling.
f. Notification of potentially impacted Public Water Systems 15 miles downstream.
g. Emergency spill and response program shall be developed, reviewed, and approved by BLM prior to surface-disturbing activities.

WTR-8: Protection of drinking water supply sources within surface water supply areas (leased or made available for leasing) will concur with Colorado Oil and Gas Conservation Commission rule 317B and subsequent updates.

WTR-9: All routes shall be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features (BLM 2012) or where appropriate BLM Manual Section 9115 standards for primitive roads (BLM 2012b). For drainage crossings, culverts should be sized for the 50 year storm event with no static head and to pass a 100-year event without failing. Site specific conditions may warrant BLM to require designs for larger events (e.g. 75-100 year storm events). Large culverts and bridges shall be designed and constructed per BLM Manual 9112 (large culverts and bridges) (BLM 2009). Large culverts and bridges shall be designed to pass a 100-year storm event (minimum).

WTR-10: Erosion control features shall be maintained through periodic inspection and maintenance, including cleaning dips and cross-drains, repairing ditches, marking culvert inlets to aid in location, and clearing debris from culverts.

WTR-11: Surface discharges shall comply with all regulatory requirements outlined in the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act), as amended through P.L. 107-303, November 27, 2002 Clean Water Act. Additionally, surface discharges should be made to well defined channels away from major erosional features. Furthermore, discharges should be limited to a volume less than or equal to the naturally occurring mean annual peak flow (which is roughly equivalent to a peak generated by a 2-year 24-hour storm event) and that can be handled by the natural channel under anticipated conditions.

WTR-12: To protect water quality, anti-backflow devices shall be utilized while drafting fresh water from streams, springs, reservoirs and wells.

WTR-13: Range improvements will conform to BLM Manual H 1740-2 and subsequent updates (BLM 2008).

WTR -14: Discharge of surface and groundwater to surface drainages will comply with the Federal Water Pollution Control Act (as amended through P.L. 107–303, November 27, 2002) and will be pre-approved by BLM and will meet the following criteria:

a. Discharge operations will not negatively impact downstream beneficial uses.
b. Discharge soil/water interactions will not facilitate the movement of water quality contaminants (e.g., salt, selenium (typically associated with Mancos shale derived soils), sediment, metals) above natural rates in surface and/or groundwater.
c. Water discharge shall be limited to well-defined major channels, to reduce potential of discharged water dissolving and transporting salts from the stream channel and to reduce concentration of salts in alluvium.
d. Discharges will be limited to a volume that can be handled by the natural channel and less than or equal to the naturally occurring mean annual peak flow (roughly equivalent to a two-year, 24-hour storm peak).
e. Discharge points will be located in stable channels or reservoirs away from any downstream head-cuts or other major erosional features (as determined by BLM). Outfall design may include discharge aprons and downstream stabilization of channel side slopes to prevent erosion and provide energy dissipation.
f. Subject to BLM approval, water quality thresholds for both surface and groundwater will be set and monitored during discharge operations in order that they will cease if thresholds were exceeded.
g. Surface and groundwater quantity and quality will be monitored during all discharge operations. Monitoring locations will be subject to BLM approval. Monitoring activities will continue for at least two water years following cessation of discharge.

WTR -15: Hazardous substances will not be used in drilling, testing, or completion operations, nor introduced at any time into the reserve or cuttings pit. Fluids will be confined to pits or tanks and all pits that may contain liquids will be lined to protect groundwater. Liners will be maintained in good condition, with no tears or holes, until they are removed when the reserve pit is closed.

WTR -16: Pits will be constructed so that water will not run into them. Fluid levels will be maintained below 2 feet of the lowest point of containment.

WTR -17: Interim and final reclamation procedures shall utilize best available science and technology to protect natural resources from undue degradation.

WTR-18: To limit surface disturbance and associated impacts to natural resources, all actions will consider the character of the topography and landform. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Rights-of-way will be shared, and structures and facilities will be grouped.

WTR-19: Provide energy dissipaters (e.g., rock piles and logs) where necessary at the downstream end of ditch relief culverts to reduce the erosion energy of the emerging water.

WTR-20: The face of cut or fill slopes shall not be subject to any concentrated flows of surface water such as from natural drainage ways, graded swales, and downspouts.

WTR-21: Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

WTR-22: Grade road surfaces only as often as necessary to maintain a stable running surface and to retain the original surface drainage.

WTR-23: Avoid cutting the toe of cut slopes when grading roads or pulling ditches.

WTR-24: The operator will be responsible for keeping road inlet and outlet ditches, catch-basins, and culverts free of obstructions, particularly before and during spring runoff. Routine machine-cleaning of ditches shall be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.

WTR -25: Remove all temporary stream crossings immediately after use and cross-ditch the ends of routes or rights-of-way to mitigate erosion from disturbed areas.

WTR -26: When designing protective/mitigation measures, consider the changes that may occur in the watershed hydrology and sedimentation over the design life of the measure. Moreover, design and construct roads that are self-maintaining and consider using road surfacing, such as gravel when year-long access may be necessary.

WTR -27: Design and construct stream crossings at right angles, in straight sections of stable reaches to handle (at a minimum) the 100-year flood, and consider culvert and bridge designs that ensure aquatic organism passage.

WTR -28: Where the access road crosses small drainages and intermittent streams not requiring culverts, low water crossings shall be used. The road will dip to the original streambed elevation of the drainage and the crossing will prevent any blockage or restriction of the existing channel. Material moved from the banks of the crossing will be stockpiled nearby for later use in reclamation. Gravel, riprap, or concrete bottoms may be required in some situations.

WTR -29: For pipeline crossings of drainage ways: Pipelines crossing at the surface must be constructed high enough to remain above the highest possible floodflows at each crossing. Pipeline crossings below the surface must be buried deep enough to remain undisturbed by scour and fill processes typically associated with passage of peak flows. A hydraulic analysis should be completed during the pipeline design phase to avoid repeated maintenance of such crossings and eliminate costly repairs and potential environmental degradation associated with pipeline breaks at stream crossings (DOI, 2007). Utilize horizontal directional boring techniques under perennial water bodies and/or wetland complexes when environmental circumstances allow.

WTR -30: Minimize crossing of streams (intermittent and perennial) and wetlands with vehicles and heavy machinery.

WTR-31: Time working in wetlands and watercourses should occur only during low flow conditions. High flows occur during late summer early fall as a result of high intensity convective thunderstorm events. Work in these areas must also be done in a manner consistent with BMPs for biological resources.

WTR-32: Exclude livestock and vehicles from spring sources and riparian areas where on-site evaluation and/or monitoring data indicate degrading conditions or potential to degrade spring or riparian function.

WTR-33: Avoid alteration of natural hydrologic function and condition in source areas for springs, seeps, fens, or other water developments. Relocate surface-disturbing activities away from these sensitive areas as site conditions warrant.

WTR-34: Limit consumptive water use from Federal point source water rights on public lands that are not sustainable and/or would jeopardize discharge to streams, springs, seeps, fens, or downstream senior water rights.

WTR-35: Manage and manipulate invasive stands of brush and weeds on forest, range, pasture land by mechanical, chemical, or biological means or by prescribed burning to improve watershed function and condition.

WTR-36: Limit surface disturbance near drainage features and minimize surface disturbance on steep slopes, fragile soils, saline soils, and Mancos shale derived soils.

WTR-37: When activity in streams, wetlands, or riparian areas is unavoidable, the operator will first employ best available technology such as eco-Matting to reduce impacts. The operator would then restore modified or damaged areas as close as practicable to natural conditions to protect banks, wetlands and to re-establish riparian vegetation.

WTR -38: Maintain to the greatest extent practicable natural flow rates and chemical and physical properties of surface and groundwater during work within stream channels, floodplains, and/or riparian areas.

WTR -39: Oil and gas drilling operations within municipal watersheds, source water protection areas, or locally important fresh water aquifers should utilize methods and materials that will prevent degradation of the underlying groundwater. This may include practices such as surface and intermediate casing through potential fresh water zones, gas blocker additives to cement jobs, the use of green fracturing fluids, and pitless drilling - closed loop drilling. The use of "Green" fracturing fluids will be documented in the form of Material Safety Data Sheets which will be reviewed by the operator for compliance prior to use. Material Safety Data Sheets will remain on site at all times such chemicals are present.

WTR-40: Water from well production tests (water wells) or hydrostatic testing of pipelines shall be filtered of sediments prior to discharge into wetlands. Energy dissipating methods (e.g., straw bales, waddles, vegetative buffers) shall be in place prior to discharge of production water or water used for hydrostatic testing.

WTR-41: Within portions of municipal watersheds and source water protection areas available for fluid minerals development, the operator should develop and implement a watershed protection plan. This plan would include characterization and monitoring of baseline hydrologic/hydrogeologic conditions such as but not limited to: water quality, water quantity, groundwater flow patterns, connectivity between geologic formations, and communication between surface and groundwater. The operator should collaborate with all watershed stakeholders in development and implementation of the watershed protection plan.

WTR-42: Livestock feeding, and salting, shall be done in a manner to protect water quality. When possible, these developments or practices should be done at least 400 meters from riparian zones. (Livestock feeding on public land is not authorized by regulation, unless approved by the authorized officer. CFR4140.1(a)(3).)

WTR-43: Maintain appropriate vegetative/riparian buffers around water features to slow runoff and trap sediments and protect water quality. A minimum buffer distance should be between 325-500ft or greater where site conditions warrant.

WTR-44: Surface disturbing actions should not permanently impair floodplain function.

WTR-45: No operations using chemical processes (except for vegetation management) or other pollutants in their activities will be allowed to occur within 200 feet of any water bodies. This includes staging equipment for refueling, and equipment maintenance.

WTR-46: Fill material will not be cast over hilltops or into drainages.

WTR-47: All pipeline welds within 100 feet of a perennial stream will be x-rayed to prevent leakage into the stream. Where pipelines cross streams that support Federal or State-listed threatened or endangered species or BLM-listed sensitive species, additional safeguards such as double-walled pipe, and remotely-actuated block or check valves on both sides of the stream may be used.

WTR-48: Baseline information of channel characteristics and riparian vegetation present must be documented before actions are permitted to disturb riparian areas and the stream channel.

WTR-49: Direct overflow from water developments back to the original natural drainage in a way that does not accelerate erosion or modify riparian habitats.

WTR-50: Avoid soil compaction or surface disturbing activities in recharge areas that could impair natural function of springs and/or seeps.

References**:**

Federal Water Pollution Control Act, as amended through P.L. 107-303, November 27, 2002

United States Department of the Interior and United States Department of Agriculture. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

BLM. 2009. H-9112-1 Bridges and Major Culverts Handbook. Bureau of Land Management, Washington, D.C.

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VEGETATION: RANGELAND

VEG-RAN-1: When making decisions about proposed projects/actions in known sagebrush habitat, existing plans and guidance will be used by interdisciplinary teams and considered in the decision making process. This guidance includes the conservation actions/guidelines identified in the Western Association of Fish and Wildlife Agencies – Conservation Assessment of Greater Sage-grouse and Sagebrush habitats (2004), and local working group population plans (North Eagle-Southern Routt Population of Greater Sage-grouse and Parachute Piceance Roan Population of Greater Sage Grouse) or the most recent guidance.

VEG-RAN-2: Prepare a reclamation plan and weed management plan prior to ground-disturbing activities. Realize that seeding or planting native plants may need to be repeated until deemed successful.

VEG-RAN-3: Develop vegetation objectives that include desired plant composition, canopy and ground cover prior to conducting vegetation treatments or revegetation efforts.

VEG-RAN-4: Utilize the techniques and methods for vegetation treatments identified in the Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

VEG-RAN-5: Close and rehabilitate roads quickly when they are no longer needed.

VEG-RAN-6: Build roads to the appropriate standard, no higher than necessary for use and safety, and utilize primitive or two-track roads rather than constructing new roads where feasible.

VEG-RAN-7: Pipelines (and electrical power lines when possible) shall be placed within road corridors to minimize disturbance.

VEG-RAN-8: Minimize disturbance to soil and native vegetation as much as possible.

VEG-RAN-9: Stockpile topsoil for use in final reclamation. Topsoil shall be stored separately from other fill materials.

VEG-RAN-10: When timely natural regeneration of the native plant community is not likely to occur, carefully select species that will not compete with or exclude botanical resources for revegetation efforts. Bare sites shall be seeded as soon as appropriate to prevent establishment of undesirable plant species.

VEG-RAN-11: Utilize appropriate sagebrush species/subspecies and important understory plants relative to site potential in seedings.

VEG-RAN-12: Ensure that seed used for revegetation as well as straw and hay bales used for erosion control are certified free of noxious weeds.

VEG-RAN-13: Monitor the long-term success of revegetation efforts (according to the Reclamation Plan or Vegetation Objectives of the vegetation treatment plan) to ensure successful establishment of desired species and detect any noxious weed infestations. If revegetation is unsuccessful, continue efforts to establish desired species in disturbed sites.

VEG-RAN-14: In Salt Desert Shrub communities with biological soil crusts, require reclamation that includes, but is not limited to: broadcasting bacterial inoculants, planting native grass, forbs, and shrubs seedlings, and exclosure fences.

VEG-RAN-15: Implement vegetative treatments that focus on controlling cheatgrass, providing appropriate range of sagebrush densities and age-classes and an herbaceous understory with appropriate species diversity and cover to sustain sagebrush-obligate species.

VEG-RAN-16: Avoid natural and prescribed fire in low-elevation cheatgrass-infested sage-brush communities.

VEG-RAN-17: Implement treatments designed to reduce pinyon-juniper and conifer encroachment.

VEG-RAN-18: Emphasize perpetuating mid- to late-seral mountain shrubland communities that provide suitable habitat for wildlife.

VEG-RAN-19: Avoid treatments in mature Gambel oak savanna-like stands (those stands where the average basal stem diameter is greater than six inches), except in WUI areas.

VEG-RAN-20: Use prescribed fire, natural ignitions, and mechanical or chemical treatments to create openings within dense stands and promote a diverse age-class structure.

References:

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VEGETATION: RIPARIAN AND WETLAND HABITATS

VEG-RIP-1: Utilize the techniques and methods for vegetation treatments identified in the Record of Decision for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

VEG-RIP-2: Utilize the techniques and processes for protection of floodplains as identified in Executive Order 11988 – Floodplain Management.

VEG-RIP-3: Road crossings that will be used for longer than one year on perennial streams will be engineered and approved by the BLM Authorized Officer.

VEG-RIP-4: Do not locate roads or other facilities immediately parallel to streams. Where roads or facilities must cross streams, cross perpendicularly and immediately exit the buffer zone.

VEG-RIP-5: Armor low water stream crossings, place properly sized culverts, or span streams as appropriate to protect the riparian zone.

VEG-RIP-6: Maintain a minimum of six inch stubble height for the key specie(s) of that riparian area by the end of October or winter grazing rotation on stream bank (lotic) riparian. If riparian system stability is dependent upon key riparian grasses and forbs, maintain adequate stubble height to dissipate energy from spring runoff.

VEG-RIP-7: Maintain a minimum of four inch stubble height on key species at the end of October on wet meadows (lentic) systems.

VEG-RIP-8: Roads and trails (off-highway vehicle, horse, bicycle, hiking) will avoid wetlands and if avoidance is not possible will be designed and constructed in accordance Technical Reference 2E22A68-NPS, Off-highway Vehicle Management.

VEG-RIP-9: Minimize crossing of streams (intermittent and perennial) and wetlands with vehicles, heavy machinery, and facilities (e.g. pipelines).

VEG-RIP-10: Locate residue piles (e.g., sawdust, field chipping residue, disposal ponds) away from drainages where runoff may wash residue into water bodies or wetlands.

VEG-RIP-11: Manage vegetation in riparian areas to provide wildlife habitat, adequate shade, sediment control, bank stability, and recruitment of wood into stream channels.

VEG-RIP-12: Locate project staging areas for refueling, maintenance equipment, materials, operating supplies, and boring in areas not designated as riparian and/or wetland areas.

VEG-RIP-13: Minimize surface disturbance within riparian areas and in wetlands.

VEG-RIP-14: Avoid late summer or early fall grazing in areas with declining willow populations. If grazing during these time periods must occur allow for at least one full year of rest between grazing rotations.

VEG-RIP-15: Utilize riparian pastures as appropriate to manage grazing activities in riparian areas. Vary the timing, duration, and frequency of grazing in riparian pastures.

VEG-RIP-16: Create off-stream watering facilities when possible (e.g. stock tanks, stock ponds, nose pumps, etc.). Where feasible, place grazing stock tanks and other watering facilities at least 400 meters (1/4 mile) from riparian zones and on closely the same elevation.

VEG-RIP-17: Actively move cattle to and from riparian pastures or pastures containing riparian habitat. Do not allow for cattle to drift between pastures (BLM TR-1737-14 p. 33-34).

VEG-RIP-18: Low stress stockmanship (e.g., herding, movements between pastures) methods should be used to encourage cattle grazing away from riparian areas. Cattle should be turned out away from riparian areas when entering new pastures or allotments. Cattle should also be guided to appropriate bedding areas.

VEG-RIP-19: Cull individually identified cattle from the herd that congregate or preferentially graze certain riparian area(s) for extended periods of time.

VEG-RIP-20: Place salt, molasses, and other supplements on uplands at least 400 meters (1/4 mile) away from riparian and wetland areas and on gently sloping land to encourage cattle to graze uplands and move out of riparian areas. Supplementation sites should be at least 800 meters (1/2 miles) apart. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer. CFR4140.1(a)(3).)

VEG-RIP-21: Phase the size and timing of vegetation removal treatments within riparian areas. Phasing treatments sizes and timing to reduce soil and water temperatures, maintain bank and soil stability, and retain adequate wildlife habitat for cover and nesting.

VEG-RIP-22: Phase the size and timing of vegetation removal treatments on uplands immediately adjacent to riparian areas, and buffer treatment boundaries away from riparian areas to reduce sedimentation and erosion in riparian zones. Allow for at least one 1 year between vegetation removal treatments in uplands and in riparian or wetland areas.

VEG-RIP-23: Relocate existing roads away from riparian areas as feasible during requested permitting or authorization of these routes. Reclaim abandoned portions of relocated roads back to natural conditions. Recontour routes back to natural slopes as feasible, rip compacted soils (except for in close proximity to desirable trees), and seed disturbed areas.

VEG-RIP-24: Fences should not be placed immediately on the edge of riparian areas. Place fences away from riparian or wetland areas to decrease impacts from trailing along fences.

VEG-RIP-25: Protect and restore riparian/wetland values by implementing actions including, but not limited to, adjusting livestock numbers, distribution, season of use, duration of use, plantings, recreation restrictions, structures (e.g., fencing), and upland water developments.

References:

BLM (US Department of Interior, Bureau of Land Management). 2007. Final Vegetation Treatment Using Herbicides on Bureau of Land Management Lands in 17 Western States, Programmatic Environmental Impact Statement. BLM, Nevada State Office, Reno, NV. June 2007.

National Riparian Service Team. Riparian Area Management. Technical Reference 1737-20.Grazing Management Processes and Strategies for Riparian-Wetland Areas. 2006.

The Stubble Height Review Team. 2006. Pp 6. Using Stubble Height to Monitor Riparian Vegetation. Rangelands. February

NOXIOUS AND INVASIVE WEED PREVENTION AND CONTROL

Pre-project Planning:

WEED-1: Environmental analyses for projects, vegetation treatments, and maintenance programs should assess weed risks, analyze high-risk sites for potential weed establishment and spread, and identify prevention practices.

WEED-2: Determine site-specific restoration and monitoring needs and objectives at the onset of project planning.

WEED-3: Inventory all proposed projects for weeds prior to ground-disturbing activities. If weeds are found, they should be treated (if the timing is appropriate) or removed (if seeds are present) to limit weed seed production and dispersal.

WEED-4: Wash vehicles and other equipment to reduce the spread of noxious weeds from weed-contaminated areas to non-contaminated areas. Portable wash stations would be ideal in areas of heavy oilfield traffic and in areas where noxious weeds are an issue.

WEED-5: Locate and use weed-free project staging areas. Avoid or minimize travel through weed infested areas, or restrict travel to periods when spread of disseminules is least likely.

WEED-6: Identify sites where equipment can be cleaned. Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts should be collected and incinerated when possible.

WEED-7: If certified weed-free gravel pits become available in the county, the use of certified weed-free gravel will be required wherever gravel is applied to public lands (e.g., roads).

WEED-8: Maintain stockpiled, non-infested material in a weed-free condition. Topsoil stockpiles should be promptly revegetated to maintain soil microbial health and reduce the potential for weeds.

WEED-9: Use seed mixes appropriate to the ecological site and those species that are demonstrated to be best at inhibiting weed establishment, except when other resource values dictate a less-competitive mix.

WEED-10: A certified seed laboratory shall test each seed lot according to the Association of Official Seed Analysts standards (which include an all-state noxious weed list) and provide documentation of the seed inspection test. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended.

Project Implementation:

WEED-11: Minimize soil disturbance. To the extent practicable, native vegetation should be retained in and around project activity areas, and soil disturbance kept to a minimum.

WEED-12: If a disturbed area must be left bare for a considerable length of time, cover the area with weed barrier until revegetation is possible.

Post-project:

WEED-13: Clean all equipment before leaving the project site when operating in weed infested areas.

WEED-14: Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal means bagging and incinerating seeds and plant parts or washing equipment in an approved containment area.

WEED-15: Revegetate disturbed soil where appropriate to optimize plant establishment for that specific site. Define revegetation objectives for each site. Revegetation may include topsoil replacement, planting, seeding, fertilization, and certified weed-free mulching as necessary. Use native material where appropriate and feasible.

WEED-16: Monitor sites where seed, hay, straw, or mulch has been applied. Eradicate weeds before they form seed. In contracted projects, contract specifications could require that the contractor control weeds for a specified length of time.

WEED-17: Inspect and document all ground-disturbing activities in noxious weed infested areas for at least three growing seasons following completion of the project. For ongoing projects, continue to monitor until reasonably certain that no weeds are present. Plan for follow-up treatments based on inspection results.

Roads and Utilities - Pre-project Planning:

WEED-18: Communicate with contractors, local weed districts or weed management areas about projects and best management practices for prevention.

WEED-19: Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Seeds and plant parts shall be collected and incinerated when practical, or washed off in an approved containment area.

WEED-20: Avoid acquiring water for road dust abatement where access to water is through weed-infested sites.

WEED-21: Treat weeds on travel rights-of-ways before seed formation so construction equipment doesn't spread weed seed.

WEED-22: Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. When it is necessary to blade weed-infested roadsides or ditches, schedule the activity when disseminules are least likely to be viable.

Roads and Utilities - Project Implementation:

WEED-23: Retain shade to suppress weeds by minimizing the removal of trees and other roadside vegetation during construction, reconstruction, and maintenance; particularly on south aspects.

WEED-24: Do not blade or pull roadsides and ditches infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure weeds remain onsite. Blade from least infested to most infested areas.

Roads and Utilities - Post-project:

WEED-25: Clean all equipment (power or high-pressure cleaning) of all mud, dirt, and plant parts before leaving the project site if operating in areas infested with weeds. Seeds and plant parts shall be collected and incinerated when possible.

WEED-26: When seeding has been specified for construction and maintenance activities, seed all disturbed soil (except travel route) soon after work is completed.

WEED-27: Use a certified weed-free seed mix suitable for local environmental conditions that includes fast, early growing (preferably native) species to provide quick revegetation. Consider applying weed-free mulch with seeding.

WEED-28: Periodically inspect roads and rights-of-way for noxious weeds. Train staff to recognize weeds and report locations to the local weed specialist. Follow-up with treatment when needed.

WEED-29: When reclaiming roads, treat weeds before roads are made impassable. Inspect and follow up based on initial inspection and documentation.

WEED-30: To avoid weed infestations, create and maintain healthy plant communities whenever possible, including utility rights-of-ways, roadsides, scenic overlooks, trailheads, and campgrounds.

Recreation Activities:
WEED-31: Inspect and clean mechanized trail vehicles of weeds and weed seeds.

WEED-32: Wash boots and socks before hiking into a new area. Inspect and clean packs, equipment, and bike tires.

WEED-33: Avoid picking unidentified "wildflowers" and discarding them along trails or roadways.

WEED-34: Maintain trailheads, campgrounds, visitor centers, boat launches, picnic areas, roads leading to trailheads, and other areas of concentrated public use in a weed-free condition. Consider high-use recreation areas as high priority sites for weed eradication.

WEED-35: Sign trailheads and access points to educate visitors on noxious and invasive weeds and the consequences of their activities.

WEED-36: In areas susceptible to weed invasion, limit vehicles to designated, maintained travel routes. Inspect and document travel corridors for weeds and treat as necessary.

WEED-37: Encourage use of pelletized feed for backcountry horsemen and hunters. Pelletized feed is unlikely to contain weed seed.

Outfitting / Recreation Pack and Saddle Stock Use:
WEED-38: Allow only certified weed-free hay/feed on BLM lands.

WEED-39: Inspect, brush, and clean animals (especially hooves and legs) before entering public land. Inspect and clean tack and equipment.

WEED-40: Regularly inspect trailheads and other staging areas for backcountry travel. Bedding in trailers and hay fed to pack and saddle animals may contain weed seed or propagules.

WEED-41: Tie or contain stock in ways that minimize soil disturbance and prevent loss of desirable native species.

WEED-42: Authorized trail sites for tying pack animals should be monitored several times per growing season to quickly identify and eradicate new weeds. Trampling and permanent damage to desired plants are likely. Tie-ups shall be located away from water and in shaded areas where the low light helps suppress weed growth.

WEED-43: Educate outfitters to look for and report new weed infestations.

Wildlife Habitat Projects:
WEED-44: Incorporate weed prevention into all wildlife habitat improvement project designs.

Watershed Management:

WEED-45: Frequently and systematically inspect and document riparian areas and wetlands for noxious weed establishment and spread. Eradicate new infestations immediately since effective tools for riparian-area weed management are limited.

WEED-46: Promote dense growth of desirable vegetation in riparian areas (where appropriate) to minimize the availability of germination sites for weed seeds or propagules transported from upstream or upslope areas.

WEED-47: Address the risk of invasion by noxious weeds and other invasive species in watershed restoration projects and water quality management plans.

Grazing Management:

WEED-48: Consider prevention practices and cooperative management of weeds in grazing allotments. Prevention practices may include:

- **a.** Altering season of use
- **b.** Minimizing ground disturbance
- **c.** Exclusion
- **d.** Preventing weed seed transportation
- **e.** Maintaining healthy vegetation
- **f.** Revegetation
- **g.** Inspection
- **h.** Education
- **i.** Reporting

WEED-49: When authorized, provide certified weed-free supplemental feed in a designated area so new weed infestations can be detected and treated immediately. Pelletized feed is unlikely to contain viable weed seed. (Supplemental feeding of livestock on public land is not authorized by regulation, unless approved by the authorized officer. CFR4140.1(a)(3).)

WEED-50: If livestock may contribute to seed spread in a weed-infested area, schedule livestock use prior to seed-set or after seed has fallen.

WEED-51: If livestock were transported from a weed-infested area, annually inspect and treat entry units for new weed infestations.

WEED-52: Consider closing infested pastures to livestock grazing when grazing will either continue to exacerbate the condition or contribute to weed seed spread. Designate those pastures as unsuitable range until weed infestations are controlled.

WEED-53: Manage the timing, intensity (utilization), duration, and frequency of livestock activities to maintain the competitive ability of desirable plants and retain litter cover. The objective is to prevent grazers from selectively removing desirable plant species and leaving undesirable species.

WEED-54: Exclude livestock grazing on newly seeded areas with fencing to ensure that desired vegetation is well established, usually after 2-3 growing seasons.

WEED-55: Reduce ground disturbance, including damage to biological soil crusts. Consider changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.

WEED-56: Inspect areas of concentrated livestock use for weed invasion, especially watering locations and other sensitive areas that may be particularly susceptible to invasion. Inventory and manage new infestations.

Fire Management Plans:

WEED-57: Prescribed fire plans should include pre-burn invasive weed inventory and risk assessment components as well as post-burn mitigation components.

WEED-58: Integrate prescribed fire and other weed management techniques to achieve best results. This may involve post-burn herbicide treatment or other practices that require careful timing.

WEED-59: Include weed prevention and follow-up monitoring in all prescribed fire activities. Include in burn plans the possibility for post-burn weed treatment.

WEED-60: For prescribed burns, inventory the project area and evaluate potential weed spread with regard to the fire prescription. Areas with moderate to high weed cover should be managed for at least 2 years prior to the prescribed burn to reduce the number of weed seeds in the soil. Continue weed management after the burn.

WEED-61: Ensure that a weed specialist is included on a Fire Incident Management Team when wildfire or prescribed operations occur in or near a weed-infested area. Include a discussion of weed prevention operational practices in all fire briefings.

WEED-62: Use operational practices to reduce weed spread (e.g., avoid weed infestations when locating fire lines).

WEED-63: Identify and periodically inspect potential helispots, staging areas, incident command posts, and base camps and maintain a weed-free condition. Encourage network airports and helibases to do the same.

WEED-64: Develop a burned-area integrated weed management plan, including a monitoring component to detect and eradicate new weeds early.

Fire-fighting:

WEED-65: Ensure that all equipment (including borrowed or rental equipment) is free of weed seed and propagules before entering incident location.

WEED-66: When possible, use fire suppression tactics that reduce disturbances to soil and vegetation, especially when creating fire lines.

WEED-67: Use wet or scratch-lines where possible instead of fire breaks made with heavy equipment.

WEED-68: Given the choice of strategies, avoid ignition and burning in areas at high risk for weed establishment or spread.

WEED-69: Hose off vehicles on site if they have traveled through infested areas.

WEED-70: Inspect clothing for weed seeds if foot travel occurred in infested areas.

WEED-71: When possible, establish incident bases, fire operations staging areas, and aircraft landing zones in areas that have been inspected and are verified to be free of invasive weeds.

WEED-72: Cover weed infested cargo areas and net-loading areas with tarps if weeds exist and can't be removed or avoided.

WEED-73: Flag off high-risk weed infestations in areas of concentrated activity and show weeds on facility maps.

WEED-74: If fire operations involve travel or work in weed infested areas, a power wash station should be staged at or near the incident base and helibase. Wash all vehicles and equipment upon arrival from and departure to each incident. This includes fuel trucks and aircraft service vehicles.

WEED-75: Identify the need for possible fire rehab to prevent or mitigate weed invasion during fire incident and apply for funding during the incident.

Post-fire Rehabilitation:

WEED-76: Have a weed specialist review burned area rehabilitation reports to ensure proper and effective weed prevention and management is addressed.

WEED-77: Thoroughly clean the undercarriage and tires of vehicles and heavy equipment before entering a burned area.

WEED-78: Treat weeds in burned areas. Weeds can recover as quickly as 2 weeks following a fire.

WEED-79: Schedule inventories 1 month and 1 year post-fire to identify and treat infestations. Eradicate or contain newly emerging infestations.

WEED-80: Determine soon after a fire whether revegetation is necessary to speed recovery of a native plant community, or whether desirable plants in the burned area will recover naturally. Consider the severity of the burn and the proportion of weeds to desirable plants on the land before it burned. In general, more severe burns and higher pre-burn weed populations increase the necessity of revegetation. Use a certified weed-free seed mix.

WEED-81: Inspect and document weed infestations on fire access roads, equipment cleaning sites, and staging areas. Control infestations to prevent spread within burned areas.

WEED-82: Seed and straw mulch to be used for burn rehabilitation (e.g., for wattles, straw bales, dams) shall be certified weed-free.

Educational Programs:
WEED-83: Promote weed awareness and preventative behavior through public contact, volunteer programs, and educational materials (e.g., weed identification brochures, Tread Lightly program).

Vegetation Treatments:
WEED-84: Use appropriate integrated vegetation treatments (e.g., chemical, mechanical, planned and unplanned fire, biological) for the control of invasive/noxious weeds. Use of herbicides would be consistent with current local, state, and BLM policy.

Cheatgrass:
WEED-85: Treat monocultures of cheatgrass and other exotic communities through prescribed grazing and chemical, biological, and mechanical treatment methods where eradication is possible. Establish desired vegetation by seeding.

FISH AND WILDLIFE MANAGEMENT

Fish and Wildlife Management – All:

FWL-GEN-1: Application of BMPs in Instruction Memorandum No. 2013-033. This IM addresses BMPs for reducing the risk of direct wildlife mortality from the following five fluid mineral practices:

1. Open Pits and Tanks Containing Freestanding Liquids;
2. Chemical Tank Secondary Containment;
3. Pit, Tank, and Trench Entrapment Hazards;
4. Exhaust Stacks; and
5. Wire Exclosure Fences for Well Pads or Production Facilities and Associated Rights-of-way.

FWL-GEN-2: Cooperate on the introduction, translocation, transplantation, restocking, augmentation, and reestablishment of native and naturalized fish and wildlife species in cooperation with CPW and/or USFWS, subject to the guidance provided by BLM's 1745 policy and by existing or future memorandums of understanding with CPW.

Fish and Wildlife Management – Fisheries and Aquatic Species – General:
FWL-AQU-1: Consider the following options regarding erosion control to limit sedimentation into perennial, ephemeral, and intermittent drainages:

- Placement of straw waddles
- Construction of silt fencing
- Placement of geo-textile matting/fabrics
- Timely and appropriate reseeding methods and species
- Hydro-mulching
- Topsoil stockpiling
- Recontouring slopes at a minimum of 2:1 to facilitate revegetation
- Hay bales
- Sediment retention dams

- Water dips

FWL-AQU-2: Avoid direct discharge of pipeline hydrostatic test water to any reservoir, lake, wetland, or natural perennial or seasonally flowing stream or river.

FWL-AQU-3: When constructing stream crossings or other in-channel structures, divert water around the construction site to minimize sedimentation.

FWL-AQU-4: Avoid low water crossings of live streams, but if done, armor crossings with appropriate sized native substrate to limit sedimentation and maintain water depths for fish passage.

FWL-AQU-5: For perennial stream crossings use professional engineering to design and consider using bridges or appropriately sized culverts of at least bank-full flow width.

FWL-AQU-6: When possible, design road crossings of streams and riparian corridors at right angles and preferably along straight, stable stream reaches to minimize the area and amount of disturbance. However, when needed, place culverts in alignment with natural stream sinuosity.

FWL-AQU-7: Address aquatic organism passage and appropriate life-stage requirements of target species when designing new or modifying existing road/stream crossings.

FWL-AQU-8: Identify and protect access to ephemeral/temporary pools and ponds to provide breeding, aestivating, and hibernating habitat for amphibians.

FWL-AQU-9: To avoid spread of aquatic nuisance species and disease vectors clean and disinfect all equipment and gear used in water by one of the following methods:

- by spraying with 409, bleach, or a similar germicide solution and let equipment thoroughly dry.
- wash/spray equipment and gear with hot tap water > 140 degrees Fahrenheit for 10 minutes and then drain onto the ground, not down a drain or into another water body.

FWL-AQU-10: Improve stream conditions associated with past, ongoing, and future planning, construction, and maintenance actions in the I-70 mountain corridor as per Stream and Wetland Ecological Enhancement Program (SWEEP) MOU.

FWL-AQU-11: Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications (e.g., Rosgen). Upon identification of limiting factors, prioritize and fix those that can be fixed using proven river, stream, lake, and riparian methodologies (e.g., in-channel habitat structures to create pools, riparian plantings, tamarisk removal), or by changing management of other program activities (e.g., changing livestock grazing season of use) to achieve desired future condition.

FWL-AQU-12: Identify in-channel features (e.g., culverts, water diversion structures) that block aquatic organism movement and/or impair stream connectivity and replace, modify, or remove these impediments as they are identified and as opportunities allow. Consider and address aquatic organism passage and appropriate life-stage requirements when designing new or modifying existing stream crossings. Where in-channel barriers are needed to protect native fish species from competitive species and/or disease vectors, consider placement in coordination with CPW Aquatic Biologists and BLM staff.

References:

Colorado Division of Wildlife (CDOW). 2008. Actions to Minimize Adverse Impacts to Wildlife. [Online]. Website. www.oilandgasbmps.org/docs/CO27-ColoradofinalBMP1008.doc.

Fish and Wildlife Management – Terrestrial Species:

General:

FWL-TER-1: Conduct development on existing or previously disturbed surface locations to reduce impacts on undisturbed areas and minimize impact on wildlife habitat.

FWL-TER-2: Strategically apply fugitive dust control measures to reduce coating of vegetation and deposition in water sources, including enforcing established speed limits on BLM and private roads.

FWL-TER-3: Ensure that ponds containing waste water are closed off to exclude birds, bats, amphibians and other wildlife attracted to the water.

FWL-TER-4: Coordinate with the Colorado Parks and Wildlife (CPW) on BLM projects and BLM-authorized projects that are proposed within 0.5-mile of a small capacity water development and 2.0-mile of a large capacity wildlife water development. Projects determined to have a detrimental effect on wildlife using wildlife water developments will be avoided or rerouted if possible.

FWL-TER-5: Design lighting required for recreation, oil and gas, and other programs to be directing downward, using shielded lights, and only the minimum illumination required, utilize green lights in areas that require illumination at night and prevent skyward projection of lighting that may disorient night migrating birds. Sodium vapor lights, widely used for streetlights and security lighting, should not be used because they have been shown to attract night-flying birds. Coordinate with CPW on migratory bird inventories when migratory bird inventories are proposed by BLM or required of third parties.

FWL-TER-6: The use of deicers and dust suppressants within 100 meters (328 feet) of road-side occurrences of special status plant species will require prior approval from the BLM.

FWL-TER-7: Use temporary water delivery lines laid on the surface of the ground to reduce truck traffic.

FWL-TER-8: Where linear disturbance is proposed edges of vegetation shall be feathered to avoid long linear edges of habitat and allow for greater habitat complexity for wildlife.

FWL-TER-9: Avoid fragmentation of wildlife habitat especially in wildlife migration and movement corridors.

FWL-TER-10: Encourage the use of a variety of BMPs, as defined by "Best Management Practices for Oil and Gas Development on Public Lands," http://www.blm.gov/bmp/. (These BMPs may be changed over time)

FWL-TER-11: Implement closed-loop drilling systems on all active rigs, using only a small cuttings mixing area on each location.

FWL-TER-12: Optimize completion operations to minimize impact. Techniques include:

a) Simultaneous drilling and completion operations minimize the operating time on the well pad, where space and safety restrictions permit the use of this technique.
b) Remote completion operations using nearby existing well pads minimize overall surface disturbance.

FWL-TER-13: Reuse water whenever possible for drilling and completion activities. Recycle all water used in completion activities to meet water needs for completion of subsequent wells on location; this will reduce fresh water consumption and reduce truck traffic.

FWL-TER-14: - Expand the water distribution system to efficiently move water in pipelines, reducing truck traffic for drilling and completion activities.

FWL-TER-15: Use existing roads instead of new construction segments wherever feasible.

FWL-TER-16: Seed all access roads and facilities other than well pads in a timely manner after construction has been completed. Seed all topsoil from pad construction.

FWL-TER-17: Noise reduction techniques and designs will be used to reduce noise from compressors or other motorized equipment.

FWL-TER-18: - Where new roads are constructed seasonal restrictions on public vehicular access will be evaluated where there are wildlife conflict or road damage/maintenance issues.

FWL-TER-19: Install multiple pipelines in a single trench, to minimize disturbance.

FWL-TER-20: Limit flaring operations when well pads are within 100 m of occupied special status species habitat. Control activities conducted by the US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services will be coordinated with the CRVFO on an annual basis, including review of authorized control areas and annual submittal of control activities on CRVFO lands.

FWL-TER-21: US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services will notify the CRVFO before any damage control activity is implemented within the restricted area(s), and exceptions will be approved on a case-by-case basis.

FWL-TER-22: All persons involved with wildlife damage management activities shall be briefed on the regulations and penalties relating to harassment of wild horses prior to commencing animal control operations.

FWL-TER-23: The CRVFO will identify through the US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services annual work plan process areas of public lands considered special resource use areas on which control activities be avoided except as requested by CPW, or other protective restrictions may apply. Examples may include special status species habitats (e.g., sage-grouse leks and nesting areas, and bald eagle nests).

FWL-TER-24: Management policies must be adhered to at all times in Wilderness Study Areas and the CRVFO must be notified before any wildlife damage management activity is implemented. Wildlife damage management activities in Wilderness Study Areas must be directed at the offending animal. Aerial hunting may be allowed in Wilderness Study Areas as long as those actions do not impair wilderness characteristics.

FWL-TER-25: All US Environmental Protection Agency use restrictions and requirements for toxicants are to be followed where control devices are employed on public lands. The CRVFO must be notified before any toxicants are deployed and a map of the treatment area must be provided. Adequate signage must be provided and maintained.

FWL-TER-26: Retain existing snags for wildlife use in places where they will not create a human hazard.

FWL-TER-27: Collocate rights-of-ways (pipelines, roads, powerlines) whenever feasible to reduce ground disturbance

FWL-TER-28: Increase the permeability of the I-70 corridor for wildlife migration by providing long-term protection and restoration of wildlife linkages as per ALIVE MOU.

Fish and Wildlife Management – Terrestrial Species – Bats:

FWL-TER-28: Consult with CPW regarding locations of known bat roost sites.

FWL-TER-29*:* Apply national and state response strategies (USFWS 2011, BLM 2010 and CDOW 2011) for the prevention and management of White-nose Syndrome.

Colorado Division of Wildlife (CDOW). 2011. White-Nose Syndrome in Bats Response Plan. [Online]. Website. http://www.whitenosesyndrome.org/sites/default/files/resource/cdow_wnsresponseplanjan2011final.pdf.

US Fish and Wildlife Service (CDOW). 2011. A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats. [Online]. Website. http://whitenosesyndrome.org/sites/default/files/white-nose_syndrome_national_plan_may_2011.pdf

Fish and Wildlife Management – Terrestrial Species – Big Game Species:

FWL-TER-30: Fences constructed will comply with applicable wildlife fence standards, such as those described in BLM Handbook H-1741-1, Fencing (BLM 1989). Current standards for fencing cattle out in deer and elk range is a four strand fence, 40 inches high with a spacing of wires from ground to top of 60"(smooth bottom wire), 6" (second wire barbed), 6" (third wire barbed), 12" (top wire preferably smooth but may need to be barbed in areas of intense cattle use).

Fluid Minerals:

FWL-TER-31: In critical and severe winter range for deer and elk avoid recurring transportation activity within two hours before and after sunrise and sunset to avoid disturbing wintering wildlife between Dec1 and May1 (excluding emergencies).

FWL-TER-32: For intensive activities within winter range for wildlife use carpooling for activities like crew rotations and shift changes.

FWL-TER-33: For intensive activities within winter range for wildlife monitor and enforce speed limits

FWL-TER-34: - Reduce visits to well sites through remote monitoring (i.e. SCADA) and the use of multi-function contractors.

FWL-TER-35: Use solar panels as an alternative energy source for on location production equipment, to limit trips to the location for production maintenance.

Fish and Wildlife Management – Terrestrial Species – Bighorn Sheep:

FWL-TER-36: Consult with CPW regarding big game seasonal restrictions on wintering or production areas.

FWL-TER-37: Avoid low elevation (below 500 feet altitude) helicopter overflights within 1 mile radius of bighorn sheep winter range during seasonal restrictions.

FWL-TER-38: Avoid low elevation (below 500 feet altitude) helicopter overflights within 1 mile radius of bighorn sheep production areas during seasonal restrictions.

FWL-TER-39: Gate single-purpose roads to reduce traffic disruptions to wildlife.

FWL-TER-40: Close and immediately reclaim all roads that are redundant, not used regularly, or have been abandoned to the maximum extent possible to minimize disturbance and habitat fragmentation.

FWL-TER-41: Identify critical habitat types and adjust development sites to avoid these areas.

FWL-TER-42: Restrict post-development well site visitations to the hours of 10:00 a.m. to 3:00 p.m. and reduce well site visitations during winter months.

References:

Colorado Division of Wildlife (CDOW). 2008. Actions to Minimize Adverse Impacts to Wildlife. [Online]. Website. www.oilandgasbmps.org/docs/CO27-ColoradofinalBMP1008.doc.

Fish and Wildlife Management – Terrestrial Species – Black Bear:

FWL-TER-43: Identify, avoid and protect climax mast producing vegetation that annually provides a significant source of fall forage for black bear, especially those areas that can be identified as being consistently frost-free and that provide mast when unfavorable conditions exist elsewhere.

FWL-TER-44: Initiate a food and waste/refuse management program that uses bear-proof food storage containers and trash receptacles.

FWL-TER-45: Establish policy to prohibit keeping food and trash in sleeping quarters.

FWL-TER-46: Establish policy to support enforcement of state prohibition on feeding of black bear.

FWL-TER-47: Report bear conflicts immediately to CPW.

References:

Colorado Division of Wildlife (CDOW). 2008. Actions to Minimize Adverse Impacts to Wildlife. [Online]. Website. www.oilandgasbmps.org/docs/CO27-ColoradofinalBMP1008.doc.

Fish and Wildlife Management – Terrestrial Species – Migratory Birds/Raptors:

FWL-TER-48: Coordinate with FWS and CPW at the onset of project planning and apply national and state recovery and conservation plans.

FWL-TER-49: Where disturbance cannot be avoided, the scale and the length of time of disturbance may be considered mitigating circumstances.

FWL-TER-50: Inspect and clear an area for migratory bird nesting. These clearances could be performed by BLM or other qualified personnel. Factors to weigh in considering this option include vegetation type, vegetation density, timing and cost.

FWL-TER-51: To protect nesting raptors, raptor surveys shall be conducted prior to activities that could impact nesting activities. Based on the survey results apply mitigation measures.

FWL-TER-52: Apply Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 2006 (Avian Power Line Interaction Committee 2006) and Avian Protection Plan (APP) Guidelines (Avian Power Line Interaction Committee and USFWS 2005) for new power line construction (including upgrades and reconstruction) to prevent electrocution of raptors.

References:

Bureau of Land Management (BLM). 2007. Migratory Bird Treaty Act Interim Management Guidance. Instruction Memorandum No. 2008-050. [Online]. Website: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/20080/im_2008-050__migratory.html.

Gillihan, S. W. 2006. Sharing the land with pinyon-juniper birds. Partners in Flight Western Working Group. Salt Lake City, Utah. 39pp. [Online]. Website: http://www.partnersinflight.org/pif/pub/PJ manual Nov 08 low-res.pdf

Paige, C. and S. A. Ritter. 1999. Birds in a sagebrush sea: managing sagebrush habitats for bird communities. Partners in Flight Western Working Group. Boise , ID. 52 pp. [Online]. Website: http://www.partnersinflight.org/wwg/sagebrush.pdf.

Special Status Species

Special Status Species – All:

Fluid Minerals:

SSS-GEN-1: The CRVFO will consult agency species management plans and other conservation plans as appropriate to guide management and devise mitigation measures when needed. Examples of these plans include, but are not limited, to the Colorado Wildlife Action Plan, Colorado Sagebrush: A Conservation Assessment and Strategy, National, range-wide, statewide and local working group conservation plans for Gunnison and greater sage grouse, Sharing the land with pinyon-juniper birds, Birds in a sagebrush sea: managing sagebrush habitats for bird communities, North American Landbird Conservation Plan, North American Waterbird conservation Plan, National and Colorado Partners in flight Bird Conservation Plans, Colorado Gunnison's and White-tailed Prairie Dog Conservation Strategy and Recovery plans for federally listed species, and Colorado Rare Plant Conservation Initiative's Recommended Best Management Practices for Plants of Concern.

SSS-GEN-2: Lessees will be notified when a lease parcel contains potential habitat for threatened, endangered, proposed, candidate or BLM sensitive plants, fish and wildlife.

SSS-GEN-3: Limit flaring operations when well pads are within 100 m of occupied special status species habitat.

SSS-GEN-4: Application of BMPs in Instruction Memorandum No. 2013-033. This IM addresses BMPs for reducing the risk of direct wildlife mortality from the following five fluid mineral practices:

- Open Pits and Tanks Containing Freestanding Liquids;
- Chemical Tank Secondary Containment;
- Pit, Tank, and Trench Entrapment Hazards;
- Exhaust Stacks; and
- Wire Exclosure Fences for Well Pads or Production Facilities and Associated Rights-of-way.

Special Status Species – Plants:

General:

SSS-PLT-1: Prior to approving any ground-disturbing activities, suitable habitat[1] for special status plants will be identified based on existing plant location records, soil or geological mapping, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience and knowledge of the species prior to starting work.

SSS-PLT-2: For surface-disturbing activities with the potential to affect special status species, surveys will extend at least 200 meters (656 feet) beyond the edge of disturbance. For linear features such as roads and pipelines, surveys will extend at least 100 meters (328 feet) beyond the edge of the proposed ground disturbance along each side of the right of way. If special status plants are found within the survey area, the contractor will endeavor to determine the complete areal extent of the occurrence and the approximate number of individuals within the occurrence.

SSS-PLT-3: For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of occupied plant habitat[1] wherever possible and where geography and other resource concerns allow[2]. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

SSS-PLT-4: For BLM sensitive species surface-disturbing activities will be avoided within 100 meters of occupied plant habitat[1] wherever possible and where geography and other resource concerns allow[2]. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

SSS-PLT-5: Where surface-disturbing activities are allowed within 100 meters of occupied habitat for special status plant species, unauthorized disturbance of plant habitat will be avoided by on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the Fish and Wildlife Service. In such instances, a monitoring plan approved by the Service will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.

SSS-PLT-6: Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but it is unlikely that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts).

SSS-PLT-7: Transplantation of potentially affected plants will not be used as a rationale to defend a "not likely to adversely affect" or a "no effect" determination for listed plant species.

SSS-PLT-8: Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

SSS-PLT-9: Prepare a reclamation plan and weed management plan prior to ground-disturbing activities. Realize that seeding or planting native plants may need to be repeated until deemed successful by the Authorized Officer.

SSS-PLT-10: Rigorously monitor and control all infestations of noxious weeds and other non-native invasive plant species in and adjacent to occupied habitat for special status plants.

SSS-PLT-11: Control noxious weeds using integrated techniques. Limit chemical control in areas with special plant species to avoid damage to non-target species. Mechanical or chemical control in and near special status plant habitat shall only be implemented by personnel familiar with the rare plants.

SSS-PLT-12: Broadcast spraying of herbicides, either by ground or aerial methods, shall comply with the Conservation Measures from the Biological Assessment for the Vegetation EIS. The conservation measures are specific to the herbicide to be used, the desired mode of application, and the conditions of the site. Manual spot treatment of undesirable vegetation can occur within the listed buffer zones if it is determined by local biologists that this method of herbicide application would not pose risks to listed or proposed plant species in the vicinity. Additional precautions during spot treatment of vegetation within these buffers shall be employed to avoid pesticide drift in those cases.

SSS-PLT-13: Prevent plumes of dust and particulate matter from impacting special status plants. While new roads should not be built within 200 meters of special status plants, preexisting roads with an expected increase in traffic should be graveled (or paved) in these areas. The operator is encouraged to apply water for dust abatement to such areas during the flowering period.

SSS-PLT-14: The use of deicers and dust suppressants, other than water, within 100 meters of roadside occurrences of special status plant species will require prior approval from the BLM.

SSS-PLT-15: Prohibit collection of rare plants or plant parts, except as permitted by the BLM Authorized Officer for scientific research.

SSS-PLT-16: When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.

SSS-PLT-17: Surface disturbances (including wildfire and prescribed fires) within lower-elevation salt desert shrub and pinyon-juniper woodland habitat should review the need for cheatgrass control and/or seeding. Seeding should emphasize locally-adapted native species (or locally collected ecotypes, when available) that will not outcompete the special status plants.

SSS-PLT-18: As advances in cheatgrass-control methods are made, prioritize vegetation treatments to treat cheatgrass and to restore native perennials in lower-elevation, degraded areas (excluding OHV open areas).

Fluid Minerals:

SSS-PLT-18: Limit flaring operations when well pads are within 100m of occupied special status plant habitat.

References:

BLM (United States Department of the Interior, Bureau of Land Management). 1989. Handbook H-1741-1: Fencing. Release 1-1572. BLM, Washington, DC. December 6, 1989. 58pp.

_____. 2007. Final Vegetation Treatment Using Herbicides on Bureau of Land Management Lands in 17 Western States, Programmatic Environmental Impact Statement. BLM, Nevada State Office, Reno, NV. June 2007.

US Fish and Wildlife Service and BLM Recommendations for Avoiding Adverse Effects on Threatened, Endangered, Proposed, Candidate and BLM Sensitive Plants on BLM Lease Lands in Colorado; Draft. July 25, 2008.

Elliott, B.A., S. Spackman Panjabi, B. Kurzel, B. Neely, R. Rondeau, and M. Ewing. 2009. Recommended Best Management Practices for Plants of Concern. Practices developed to reduce the impacts of oil and gas development activities to plants of concern. Unpublished report prepared by the Rare Plant Conservation Initiative for the National Fish and Wildlife Foundation.

Special Status Species – Fish Species:

SSS-AQU-1: Minimize the spread of aquatic nuisance species including but not limited to zebra mussels, New Zealand mud snails, quagga mussels, and rusty crayfish, as well as disease vectors including whirling disease, and chytrid fungus when working in water and do the following:

- Before leaving a particular water or entering a new water body, inspect and clean equipment and gear used in the water, including heavy equipment, watercraft (boats, canoes, kayaks, rafts, etc.), trailers, oars, nets, waders, wading boots, sandals, and life jackets. Remove vegetation, mud, grit, algae, etc. and drain water from boats and other gear.

Fire Management:

SSS-AQU-2: In wildland fire situations work with the Fire Resource Advisor(s) during suppression efforts in the CRVFO to address water use and spread of aquatic nuisance species and disease vectors:

- If possible, avoid the use of these water sources for use in fire suppression actions (i.e., helicopter bucket dips, water pumps, etc.). If these waters are used for fire suppression, screen water pump intakes with ¼ inch mesh to avoid entrainment of fish.

- Clean and disinfect all fire suppression equipment including water hoses, water pumps, pumpkins, blivets, helicopter buckets, etc. between suppression incidents to avoid the transfer of aquatic nuisance species and disease vectors into the Colorado River and ponds, reservoirs, and lakes within 0.5 miles of the river.

- Do not release unused water from water tenders, fire engines, or aircraft into the Colorado River or ponds, reservoirs, or lakes within 0.5 miles of the river. Discharge unused water on upland habitats away from these water sources to avoid possible spread of aquatic nuisance species and disease vectors.

SSS-AQU-3: Avoid dropping fire retardant or foam within 300 feet of water bodies and avoid locating staging, fire retardant chemicals, refueling sites, or other chemicals within 300 feet of these waters.

SSS-AQU-4: Working with Resource Advisors, when fighting fires within drainages containing conservation populations of cutthroat trout, use water located from within the drainage area for all suppression efforts conducted within 300 feet of the occupied stream/lake.

SSS-AQU-5: When obtaining water from the Colorado River the following actions should be taken:

- The best method to avoid entrainment of fish is to pump from off-channel locations (e.g., ponds, lakes, and diversion ditches), not directly connected to the mainstem streams or rivers even during high spring flows.

- If the pump head must be located in the river channel where larval fish are known to occur, the following measures apply:

    a) do not situate the pump in a low-flow or no-flow area as these habitats tend to concentrate larval or young-of-year fishes. Instead place the pump into fast moving/riffle habitat;
    b) limit the amount of pumping, to the greatest extent possible, during that period of the year when larval fish may be present (June 1 to August 15); and
    c) avoid pumping, to the greatest extent possible, during the pre-dawn hours (two hours prior to sunrise) as larval fish drift studies indicate that this is a period of greatest daily activity.
    d) Screen all pump intakes with ¼" or finer mesh material.
    e) Report any fish impinged on any intake screens to the Fish and Wildlife Service (970.243.2778) or the Colorado Parks & Wildilfe Department:

        Northwest Region
        711 Independent Ave., Grand Junction, CO 81505
        Phone: (970.255.6100)

SSS-AQU-6: Require spill Prevention Plans for all pipeline companies and fluid mineral companies and their sub-contractors who haul or transport hazardous substances.

SSS-AQU-7: Require Spill Contingency Plans for all pipeline companies and fluid mineral companies and their sub-contractors who haul or transport hazardous substances.

SSS-AQU-8: When developing or improving water sources, consider development designs such as water wells and guzzlers, rather than surface impoundments, to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

SSS-AQU-8: Pro-actively manage special status species aquatic habitats. Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications. Upon identification of limiting factors, prioritize and fix those that can be fixed using proven river, stream, lake, and riparian methodologies (e.g., in-channel habitat structures to create pools, riparian plantings) or by changing management of other program activities (e.g., changing livestock grazing season use) to achieve desired future condition.

References:

Colorado Division of Wildlife (CDOW). 2008. Actions to Minimize Adverse Impacts to Wildlife. [Online]. Website. www.oilandgasbmps.org/docs/CO27-ColoradofinalBMP1008.doc.

Special Status Species - Terrestrial Species – Fringed Myotis and Townsend's Big-eared Bat:

SSS-TER-19: Consult with CPW regarding locations of known special status bat species roost sites.

SSS-TER-20*:* Apply national and state response strategies (USFWS 2011, BLM 2010 and CPW 2011) for the prevention and management of White-nose Syndrome.

References:

BLM (Bureau of Land Management). 2010. Bureau of Land Management White-nose Syndrome Interim Response Strategy. [Online]. Website. http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2010.Par.10218.File.dat/IM2010-181_att1.pdf

Colorado Division of Wildlife (CDOW). 2008. Actions to Minimize Adverse Impacts to Wildlife. [Online]. Website. www.oilandgasbmps.org/docs/CO27-ColoradofinalBMP1008.doc.

Colorado Division of Wildlife (CDOW). 2011. White-Nose Syndrome in Bats Response Plan. [Online]. Website. http://www.whitenosesyndrome.org/sites/default/files/resource/cdow_wnsresponseplanjan2011final.pdf.

US Fish and Wildlife Service (CDOW). 2011. A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats. [Online]. Website. http://whitenosesyndrome.org/sites/default/files/white-nose_syndrome_national_plan_may_2011.pdf

Special Status Species - Terrestrial Species – Greater Sage-Grouse:

General:

SSS-TER-21: Apply conservation measures and guidance from the Colorado Greater Sage-grouse Conservation Plan and local work group plans (North Eagle, South Route) and Connelly Guidelines.

Fire Management:

SSS-TER-22: Develop state-specific sage-grouse reference information and resource materials containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.

SSS-TER-23: Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.

SSS-TER-24: Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.

SSS-TER-25: During periods of multiple fires, ensure line officers are involved in setting priorities.

SSS-TER-26: Locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, and heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.

SSS-TER-27: Power-wash all firefighting vehicles, including engines, water tenders, personnel vehicles, and ATVs prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.

SSS-TER-28: Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.

SSS-TER-29: Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.

SSS-TER-30: Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.

SSS-TER-31: As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

SSS-TER-32: Apply conservation measures and guidance from the Colorado Greater Sage-grouse Conservation Plan, local work group plans (North Eagle, South Route), Connelly Guidelines, the BLM National Sage-grouse Habitat Conservation Strategy (2004) and Western Association of Fish and Wildlife Agencies, when appropriate.

SSS-TER-33: Consult with CPW at the earliest stage of development to review detailed maps of greater sage-grouse seasonal habitats and to help select development sites.

SSS-TER-34: Identify seasonal habitats and migratory patterns of sage-grouse. Map all seasonal habitats using CPW habitat selection models as they become available.

Reclamation:

SSS-TER-35: In greater sage-grouse habitat treat waste water pits and any associated pit containing water that provides a medium for breeding mosquitos with Bti (*Bacillus thuringiensis v. israelensis*) or take other effective action to control mosquito larvae that may spread West Nile Virus to wildlife, especially grouse.

SSS-TER-36: In consultation with CPW, replace any permanently impacted, disturbed, or altered greater sage-grouse seasonal habitats by enhancing marginal sagebrush steppe communities (big sagebrush and related communities) and grasslands within or immediately adjacent to mapped seasonal Gunnison or greater sage-grouse habitat.

SSS-TER-37: Use early and effective reclamation techniques, including an aggressive interim reclamation program, to return habitat to use by greater sage-grouse as quickly as possible.

SSS-TER-38: Reclaim/restore greater sage-grouse habitats with native grasses, forbs, and shrubs conducive to optimal greater sage-grouse habitat and other wildlife appropriate to the ecological site.

SSS-TER-39: Use high diversity (10 species or more) reclamation seed mixes in greater sage-grouse habitat.

SSS-TER-40: Avoid aggressive non-native grasses in greater sage-grouse habitat reclamation.

SSS-TER-41: Restore disturbed sagebrush sites with the appropriate sagebrush species or subspecies on disturbed sagebrush sites. Use locally collected seed for reseeding where possible.

SSS-TER-42: Reclaim mapped summer habitat with a substantially higher percentage of forbs (> 15 percent cover post establishment) than used in other areas.

SSS-TER-43: Utilize native forbs, including appropriate legumes if available in seed mixes as they are a vital component of brood-rearing habitat.

Lands and Realty:

SSS-TER-44: In priority habitat areas (PHA) evaluate and take advantage of opportunities to remove or modify existing power lines within priority sage-grouse habitat areas. When possible, require perch deterrents on existing or new overhead facilities.

SSS-TER-45: In PHA where existing leases or ROWs have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat. Within designated priority habitat, reclaim by removing these features and restoring the habitat of these ROW that are no longer in use.

SSS-TER-46: In PHA - Disposal Criteria: There is mixed ownership, and land exchanges would allow for additional or more contiguous federal ownership patterns within the priority sage-grouse habitat area.

SSS-TER-47: Disposal Considerations: Under priority sage-grouse habitat areas with minority federal ownership, include an additional, effective mitigation agreement for any disposal of federal land. As final preservation measures consider identifying and pursuing off-site compensation/ mitigation or the establishment of a conservation easement.

SSS-TER-48: In PHA where suitable conservation actions cannot be achieved, seek to acquire state and private lands with intact subsurface mineral estate by donation, purchase or exchange in order to best conserve, enhance or restore sage-grouse habitat.

Fluid Minerals:

SSS-TER-49: Reduce well site visitations to portions of the day between 9:00 a.m. and 4:00 p.m. during the lekking season (March 1 to May 15).

SSS-TER-50: Establish company guidelines to minimize wildlife mortality from vehicle collisions on roads.

SSS-TER-51: Minimize surface disturbance and fragmentation of greater sage-grouse habitat through use of the smallest facility footprints possible.

SSS-TER-52: Locate facilities in vegetation types other than sagebrush to avoid impacts to sage-grouse breeding and wintering habitat.

SSS-TER-53: Use drill mats if possible to prevent habitat loss or disturbance and reduce reclamation costs.

SSS-TER-54: Use noise reduction equipment on compressors and other development and production equipment.

SSS-TER-55: Use topographical features to provide visual concealment of facilities from known lek locations and as a noise suppressant.

SSS-TER-56: Muffle or otherwise control exhaust noise from pump jacks and compressors so that operational noise will not exceed 49 dB measured at 30 feet from the source.

SSS-TER-57: Design tanks and other facilities with structures such that they do not provide perches or nest substrates for raptors, crows and ravens.

SSS-TER-58: Install raptor perch deterrents on equipment, fences, cross arms and pole tops in greater sage-grouse habitat.

SSS-TER-59: Remove all unnecessary infrastructure.

SSS-TER-60: Where feasible, bury new power lines and retrofit existing power lines by burying them or installing perch guards to prevent their use as raptor perches.

SSS-TER-61: Design wastewater pits to minimize retention of stagnant surface water.

SSS-TER-62: In priority habitat areas (PHA) in cases where Federal oil and gas leases have been issued without adequate stipulations for the protection of sage-grouse or their habitats, consider the inclusion of conditions of approval (COAs) when approving exploration and development activities.

SSS-TER-63: When additional mitigation is necessary, conduct it in priority sage-grouse habitat areas when possible or, if that is not possible, in general sage-grouse habitat with the ability to increase sage-grouse populations.

SSS-TER-64: When additional mitigation is necessary, conduct it within the same population area where the impact occurs if possible or, if that is not possible, within the same Management Zone as the impact.

SSS-TER-65: Require a full reclamation bond specific to the site and sufficient to cover costs required for full reclamation (Connelly et al. 2000, Hagen et al. 2007).

SSS-TER-66: Use only closed-loop systems for drilling operations, with no reserve pits.

SSS-TER-67: Limit noise to less than 10 decibels (dbA) above ambient measures (typically 20 to 24 dBA) from 2 hours before until 2 hours after at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. *in preparation*).

SSS-TER-68: Require noise shields when drilling during the lek, nesting, brood-rearing, and wintering seasons.

SSS-TER-69: When fences are necessary, require a sage-grouse-safe design.

SSS-TER-70: Require proper containment and prompt removal of refuse to avoid attracting predators (Bui et al. 2011).

SSS-TER-71: In PHA locate roads to avoid important areas and habitats.

SSS-TER-72: Coordinate road construction and use among Federal fluid mineral lessees and ROW holders.

SSS-TER-73: Establish slow speed limits on BLM-administered roads or design roads for slower vehicle speeds to reduce sage-grouse mortality.

SSS-TER-74: Apply dust abatement on roads, well pads, and other surface disturbances.

SSS-TER-75: Close and rehabilitate duplicate roads by restoring original landform and establishing desirable vegetation.

SSS-TER-76: Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use (Lyon and Anderson 2003).

SSS-TER-77: Restrict the construction of tall facilities, distribution powerlines, and fences to the minimum number and amount needed.

SSS-TER-78: In PHA site and/or minimize linear ROWs to reduce disturbance and fragmentation of sagebrush habitats.

SSS-TER-79: In PHA bury new distribution power lines except when an existing line is already in place.

SSS-TER-80: Cover all fluid-containing pits and open tanks with netting (maximum 1.5-inch mesh size).

SSS-TER-81: In PHA equip tanks and other above-ground facilities with structures or devices that discourage nesting of ravens and raptors.

SSS-TER-82: In PHA maximize the area of interim reclamation on long-term access roads and well pads, including reshaping, topsoiling, and revegetating cut-and-fill slopes.

SSS-TER-83: In PHA restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.

SSS-TER-84: In PHA implement irrigation during interim or final reclamation for sites where establishment of seedlings has been shown or is expected to be difficult due to dry conditions.

SSS-TER-85: In PHA use mulching, soil amendments, and/or erosion blankets to expedite reclamation and to protect soils.

Locatable Minerals:
SSS-TER-86: Make any existing claims within the withdrawal area subject to validity exams. Include claims that have been subsequently determined to be null and avoid in the proposed withdrawal (see 43 CFR 3809.100).

SSS-TER-87: In plans of operations required prior to any proposed surface disturbing activities include as appropriate the following: Additional, effective mitigation in perpetuity for conservation. In accordance with existing policy, WO IM 2008-204). Example purchase private land and mineral rights within the priority area and deed to US Government. WO IM 2008-204 IM provides guidance for instances where onsite mitigation is not an option.

SSS-TER-88: Consider seasonal restrictions if deemed effective.

SSS-TER-89: Require sage-grouse-safe fences around sumps.

SSS-TER-90: Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

Salable Minerals:
SSS-TER-91: Restore saleable mineral pits no longer in use to meet sage-grouse habitat conservation objectives. Emphasis needs to be given to reclamation/restoration of sage grouse habitat as a viable long term goal to improve the sage grouse habitat.

SSS-TER-92: Where the federal government owns the mineral estate, and the surface is non-federal ownership, apply the same conservation measures as applied on public land. The conservation measures must be consistent with the surface owner's rights. A solicitor review may be required.

Coal:

SSS-TER-93: Recommend minimization of surface-disturbing or disrupting activities (including operations and maintenance) where needed to reduce the impacts of human activities on important seasonal sage-grouse habitats. Apply these measures during activity level planning.

Livestock Grazing:

SSS-TER-94: Within PHA, Incorporate sage grouse habitat objectives and management considerations into all BLM grazing allotments through AMPs or permit renewals.

SSS-TER-95: Establish measurable objectives related to sage-grouse habitat from baseline monitoring data, ecological site descriptions, or land health assessments/evaluations.

SSS-TER-96: In PHA utilize the reference state in ecological site descriptions as the site potential benchmark (and not just standards of range land heath or proper function condition objectives) when conducting land health assessments to determine if standards of range-land health related to sage-grouse habitat are being met.

SSS-TER-97: Manage riparian areas and wet meadows to achieve or maintain diverse species richness that includes a component of perennial forbs in conjunction with desirable riparian sedges, rushes, bulrushes and grasses.

SSS-TER-98: Manage hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by sage-grouse in the hot season (summer).

SSS-TER-99: Work cooperatively with permittees, lessees and landowners to develop grazing management strategies that integrate both public and private lands into single management units.

SSS-TER-100: Monitor measureable objectives and evaluate grazing management to ensure that management actions are achieving sage-grouse habitat objectives.

SSS-TER-101: In PHA authorize new water development for diversion from spring or seep source only when sage-grouse habitat would benefit on both upland and riparian habitat from the development or there are no negative impacts to sage grouse. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve sage-grouse habitat.

SSS-TER-102: In PHA modify existing springs, seeps developments, and associated pipelines as necessary to maintain the continuity of the predevelopment riparian habitat.

SSS-TER-103: When conducting NEPA analysis for water developments or other rangeland improvements, address the direct and indirect effects to sage-grouse populations and habitat.

SSS-TER-104: Design any new structural range improvements to conserve, enhance, or restore sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements, in this context, include but are not limited to: cattleguards, fences, enclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments.

SSS-TER-105: In PHA to reduce sage-grouse strikes and mortality, remove, modify or mark fences in high risk areas.

SSS-TER-106: In PHA design all range projects in a manner that minimizes potential for invasive species establishment. Monitor for, and treat invasive species associated with existing range improvements.

SSS-TER-107: Locate supplements (salt or protein blocks) in a manner designed to conserve, enhance or restore sage-grouse habitat.

SSS-TER-108: Locate supplements (salt or protein blocks) in a manner designed to conserve, enhance or restore sage-grouse habitat.

SSS-TER-109: Retire grazing preference on a case by case basis when the advantage to sage grouse habitat warrants, and a permittee or lessee voluntarily relinquishes their grazing preference in a specific grazing allotment.

SSS-TER-110: Offer temporary use on a case by case basis in allotments where grazing preference has been relinquished or non –use warrants, to rest other allotments that include important sage-grouse habitat.

SSS-TER-111: In PHA during drought periods, prioritize evaluating effects of the drought in sage-grouse habitat relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought (Thurow and Taylor 1999, Cagney et.al. 2010), ensure that post-drought management allows for vegetation recovery that meets sage-grouse needs in priority habitat areas.

Travel Management:

SSS-TER-112: In PHA use existing roads, or realignments to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, build any new road constructed to the absolute minimum standard necessary, and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then make additional, effective mitigation necessary to offset the resulting loss of sage-grouse habitat.

SSS-TER-113: In PHA conduct restoration of roads, primitive roads and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in wilderness study areas and with wilderness characteristics that have been selected for protection.

SSS-TER-114: In PHA when reseeding roads, primitive roads and trails, use appropriate seed mixes (appropriate for sage-grouse ecological conditions) and consider the use of transplanted sagebrush.

Vegetation Management:

SSS-TER-115: Treat monocultures of cheatgrass and other exotic communities through prescribed grazing and chemical, biological, and mechanical treatment methods where eradication is possible. Establish desired vegetation by seeding.

SSS-TER-116: Avoid prescribed fire in low-elevation cheatgrass-infested sage-brush communities. Mechanical treatments in low-elevation sage may require seeding.

SSS-TER-117: Implement treatments designed to reduce pinyon-juniper and conifer encroachment.

SSS-TER-118: Utilize appropriate sagebrush species/subspecies and important understory plants relative to site potential in seedings.

SSS-TER-119: Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to priority sage-grouse habitats to determine if they should be restored to sagebrush or habitat of higher quality for sage-grouse. If these seedings are part of an AMP/Conservation Plan or if they provide value in conserving or enhancing the rest of the priority habitats, then no restoration would be necessary. Assess the compatibility of these seedings for sage-grouse habitat or as a component of a grazing system during land health assessments (Davies et al. 2011). For example, some introduced grass seedings are an integral part of a livestock management plan and reduce grazing pressure in important sagebrush habitats, or serve as a strategic fuels management area.

SSS-TER-120: Apply appropriate seasonal restrictions for implementing vegetation management treatments according to the type of seasonal habitats present in a PHAs.

SSS-TER-121: Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species; Connelly et al. 2000, Hagen et al. 2007, Beck et al. 2009). However, if as a last resort and after all other treatment opportunities have been explored, and site specific variables allow, the use of prescribed fire that would disrupt fuel continuity or enhance land health could be considered where cheatgrass is a very minor component in the understory (Brown 1982).

SSS-TER-122: Choose native plant seeds for vegetation treatments based on availability, adaptation (site potential), probability for success, and the vegetation management objectives for the area covered by the treatment (Richards et al. 1998). Where probability of success or native seed availability is low, use species that meet soil stability and hydrologic function objectives as well as vegetation and sage-grouse habitat objectives (Pyke 2011).

SSS-TER-123: Reestablish appropriate sagebrush species/subspecies and important understory plants relative to site potential. Identify priority plant species and collect seed of understory plants and sagebrush subspecies important to sage-grouse. Establish seed harvest areas that are managed for seed production (Armstrong 2007) and are a priority for protection from outside disturbances.

SSS-TER-124: Apply post vegetation treatment management and monitoring to ensure long -term persistence of seeded native plants. Outline temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain vegetation management objectives to benefit sage-grouse and their habitats (Eiswerth and Shonkwiler 2006).

SSS-TER-125: Design vegetation treatments in sage-grouse habitats to strategically reduce wildfire threats in the greatest area. This may involve spatially arranging new vegetation treatments with past treatments, vegetation with fire-resistant serial stages, natural barriers, and roads in order to constrain fire spread and growth. This may require vegetation treatments to be implemented in a more linear versus block design (Launchbaugh et al. 2007).

SSS-TER-126: Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit sage-grouse (Meinke et al. 2009).

SSS-TER-127: Prioritize native seed allocation for use in priority sage-grouse habitat in years when preferred native seed is in short supply.

SSS-TER-128: Identify and work with partners to increase native seed availability and work with plant material centers to develop new plant materials, especially the forbs needed to restore sage-grouse habitat.

SSS-TER-129: Consider potential changes in climate (Miller at al. 2011) when proposing seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed. (Kramer and Havens 2009).

SSS-TER-130: During vegetation management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011, Launchbaugh et al. 2007). Consult with ecologists to minimize impacts to native perennial grasses.

SSS-TER-131: Ensure that proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.

SSS-TER-132: Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators.

SSS-TER-133: Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

West Nile Virus:
SSS-TER-134: Increase the size of freshwater ponds to accommodate a greater volume of water than is discharged.

SSS-TER-135: Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.

Special Status Species - Terrestrial Species – Bald Eagle:
General:
SSS-TER-136: Avoid unnecessary tree cutting within ¼ mile of known roost trees.

Wildland Fire Management:
SSS-TER-137: In order to minimize effects, both direct and indirect, to potential nesting bald eagles, avoid the aerial application of retardant or foam within 300 feet of any body of water including lakes, rivers, streams and ponds whether or not they contain aquatic life.

References:
Sage-grouse National Technical Team. 2011. A Report on National Greater Sage-Grouse Conservation Measures. [Online]. Website. http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2012.Par.52415.File.dat/IM%202012-044%20Att%201.pdf.

CULTURAL RESOURCES

CUL-1: Evaluation of all BLM activities and BLM authorized activities shall be made in compliance with BLM Manual 8100, The Foundations for Managing Cultural Resources (BLM 2004a), and subsequent 8100 series (BLM 2004b, 2004c, 2004d, 2004e, 2004f, 2004g, and 2004h); Handbook of Guidelines and Procedures for Inventory, Evaluation, and Mitigation of Cultural Resources (BLM 1998, rev. 2011); and the current State Protocol Agreement between the Colorado BLM and the Colorado State Historic Preservation Office.

CUL-2: The holder of a BLM authorization to carry out land use activities on Federal lands, including all leases and permits, must notify the BLM, by telephone and written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony (43 Code of Federal Regulations [CFR] 10.4(g)). Activities must stop in the immediate vicinity of the discovery. The discovery must be protected from the authorized activity for a period of 30 days or unless otherwise notified by the (43 CFR 10.4(c) and (d)).

CUL-3: The National Historic Preservation Act, as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during project implementation, work in that area must stop and the BLM Authorized Officer must be notified immediately. Within five working days the BLM Authorized Officer will inform the proponent as to:

a. Whether the materials appear eligible for the National Register of Historic Places;

b. The mitigation measures the proponent will likely have to undertake before the site could be used (assuming in situ preservation is not practicable), (36 CFR 800.13); and
c. A timeframe for the BLM Authorized Officer to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Office, that the BLM Authorized Officer's findings were correct and mitigation was appropriate.

CUL-4: A standard Education/Discovery stipulation for cultural resource protection shall be attached to the land use authorization. The operator or its contractor is responsible for informing all persons who are associated with the project operations that Federal laws protect cultural resources and they will be subject to prosecution for disturbing or destroying any historic or archaeological sites, or collecting any cultural objects, prehistoric or historic from federal lands.

CUL-5: Strict adherence to the confidentiality of information concerning the nature and location of archeological resources will be required of any company issued a land use authorization and all of their subcontractors (Archaeological Resource Protection Act, 16 US Code 470hh).

CUL-6: Prior to the commencement of fieldwork, consultants must perform a records search of the area to be surveyed, including a sufficient buffer area around the APE, to provide an interpretive context for the Previous Work and Expected Results sections of the final report. A Field Work Authorization is required for all projects before work takes place. A Field Work Authorization will be presented for signature at the time of the records search and must include a 7.5' map showing the extent of the project.

CUL-7: When a NEPA document specifically stipulates the need for an archaeological monitor during construction or a project is located in areas that require an archaeological monitor to be present it is the applicant's responsibility to contract an archaeological consultant holding a current Colorado BLM permit and authorized to work in the CRVFO. Fieldwork authorizations are required prior to any Cultural Resource monitoring where resources are present or reasonably expected and is permitted only when the ground surface is free of snow, unfrozen, and dry.

CUL-8: Where proposed projects or development will adversely affect a cultural resource, mitigation through testing, data recovery, or full excavation to recover scientific information, may be required. The applicant or operator accepts the full cost of mitigation and is encouraged to consider avoiding adverse effects through project relocation or redesign rather than mitigating adverse effects.

CUL-9: In complex linear or split-estate actions early coordination with private landowners will facilitate the process the BLM must complete prior to authorizing the action. To comply with the National Historic Preservation Act, the BLM must consider the effects to cultural resources on private land that result from a Federal action, such as linear rights-of-way or constructing a well pad on private land to drill to federal lease. Before an applicant can contract a cultural survey, private surface owners must be contacted and access requested to allow the cultural consultant access. If private land access is denied, projects can be authorized without completing cultural surveys on private land but this may lead to lengthy delays while the BLM completes consultation.

CUL-10: A cultural resource must be allocated to public use prior to:
a. authorizing or implementing any Heritage Tourism project;
b. when Special Recreation Permits are issued that will use a cultural resource; or

c. a BLM recreation project is proposed that involves the use or interpretation of a cultural resource.

CUL-11: When possible, locate projects in areas that are previously disturbed. To comply with the National Historic Preservation Act the BLM must identify significant cultural resources. Under the current regulations and guidelines the BLM may decide that no inventory needs to be conducted because the proposed action is located in an environment where ground disturbance has modified the surface so extensively that the likelihood of finding intact cultural resources is negligible.

CUL-12: Promote professional cultural resource research, public awareness, and education.

CUL-13: Identify measures such as the following to proactively manage, protect, and use cultural resources, including heritage areas:

- Develop heritage tourism sites.
- Interpret sites.
- Identify priority areas in need of Class III cultural resource inventories.
- Conduct Class III cultural resource inventories to comply with Section 110 of the NHPA.
- Direct proactive inventory toward testing sensitivity predictions described in the Class I overview model (Reed et al. 2008).
- Organize and conduct ongoing educational programs for the public.
- Identify priority at-risk, significant sites for stabilization and rehabilitation.

CUL-14: Review all proposed actions and coordinate with proponents early in the implementation planning process to define an area of potential effect; conduct a literature review; and complete inventories, mitigation, protection, and other related actions in consultation with the Native American Tribes, the State Historic Preservation Office and other parties, as appropriate.

CUL-15: Develop a cooperative agreement between the Tribes, BLM, Forest Service, and other interested parties to identify and protect Native American sites for the future of all Americans, by incorporating information from the Perspectives on Ute Ethnohistory in West Central Colorado which include:
Partner and collaborate with Tribes to develop interactive programs that are beneficial to both Tribal members and government entities. Such programs can include youth, elders, and families actively engaging and working to share ethnographic information as well as building ties to heritage lands.

References:

BLM (United States Department of the Interior, Bureau of Land Management). 1998. Handbook of Guidelines and Procedures for Inventory, Evaluation, and Mitigation of Cultural Resources. Rev. 2007. BLM, Colorado State Office, Lakewood, CO.

_____. 2004a. Manual 8100: The Foundations for Managing Cultural Resources. Release 8-72. BLM, Washington, DC. December 3, 2004.

_____. 2004b. Manual 8110: Identifying and Evaluating Cultural Resources. 8-73. BLM, Washington, DC. December 3, 2004.

_____. 2004c. Manual 8120: Tribal Consultation Under Cultural Resources. 8-74. BLM, Washington, DC. December 3, 2004.

_____. 2004d. Manual 8120-1: General Procedural Guidance for Native American Consultation. 8-75. BLM, Washington, DC. December 3, 2004.

_____. 2004e. Manual 8130: Planning for Uses of Cultural Resources. 8-76. BLM, Washington, DC. December 3, 2004.

_____. 2004f. Manual 8140: Protecting Cultural Resources. 8-77. BLM, Washington, DC. December 3, 2004.

_____. 2004g. Manual 8150: Permitting Uses of Cultural Resources. 8-78. BLM, Washington, DC. December 3, 2004.

_____. 2004h. Manual 8170: Interpreting Cultural Resources for the Public. 8-79. BLM, Washington, DC. December 3, 2004.

TRIBAL CONSULTATION

TBL-1: The BLM has a responsibility to develop a government-to-government relationship with the tribes: the formal relationship that exists between the Federal Government and tribal governments under United State laws. Tribal governments are considered dependent domestic sovereignties with primary and independent jurisdiction (in most cases) over tribal lands. Concerning proposed BLM plans and actions, at least the level of consideration and consistency review provided to State governments must be afforded to tribal governments.

TBL-2: The BLM is responsible for consultation under General Authorities defined as laws, executive orders, and regulations that are not considered "cultural resource authorities". The regulations implementing both Federal Land Policy and Management Act and NEPA require Native American consultation. The American Indian Religious Freedom Act and the Indian Sacred sites order (Executive Order 13007) pertain to the free exercise clause of the First Amendment (BLM Manual 8120-1 Guidelines for Conducting Tribal Consultation [BLM 2004], Federal Land Policy and Management Act Title II, NEPA Section 102, 40 CFR 1501.2 and 1501.7).

TBL-3: Tribes must be consulted whenever other governmental entities or the public are formally involved in the BLM's environmental review process in any NEPA documentation that entails public involvement or initial discussions with local or state governments (BLM Handbook H-1790-1, National Environmental Policy Act [BLM 2008]).

TBL-4: NHPA Section 106 consultations for cultural resources which are significant to Indian tribes. Consultation with an Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes. The agency official shall consult with representatives designated or identified by the tribal government. Consultation shall be conducted in a manner sensitive to the concerns and needs of the Indian tribe (36 CFR 800.2(c)(2)(ii)(C)).

TBL-5: Notification is conducted by simple one-way written means. Consultation is generally construed to mean direct, two-way communication.

TBL-6: When publishing notices or open letters to the public indicating that the BLM is contemplating an action and that comments are welcome, managers shall send individual letters, certified mail or delivery confirmed to tribes requesting their input on actions being considered. If this is an opening dialogue and a timely response is not received the manager shall follow up with personal telephone calls.

TBL-7: For the benefit of both parties, managers are encouraged to strive for the most efficient and effective method of consultation. Whatever method is chosen, all consultation activities shall be carefully documented in the official record.

TBL-8: Consultation roles can be facilitated but may not be transferred to others. Cultural resource consulting firms working for land use applicants cannot negotiate, make commitments, or otherwise give the appearance of exercising the BLM's authority in consultations.

TBL-9: Owing to their status as self-governing entities, tribes shall be notified and invited to participate at least as soon as (if not earlier than) the Governor, state agencies, local governments, and other federal agencies.

TBL-10: Tribal consultation means dialogue between a BLM manager and an American Indian Tribe. The BLM managers are encouraged to visit tribal councils and appropriate tribal leaders on a recurring basis. This face-to-face meeting helps to develop relationships that can reduce the time and effort spent in later consultation or individual projects. This government-to-government consultation shall be treated with appropriate respect and dignity of position.

References:

BLM (United States Department of the Interior, Bureau of Land Management). 2004. Manual 8120: Tribal Consultation Under Cultural Resources. 8-74. BLM, Washington, DC. December 3, 2004.

_____. 2004. Manual 8120-1: General Procedural Guidance for Native American Consultation. 8-75. BLM, Washington, DC. December 3, 2004.

_____. 2008. Handbook H-1790-1: National Environmental Policy Act. Washington, DC. January 2008.

PALEONTOLOGY

PAL-1: Attach lease notices, stipulations, and other requirements to permitted activities to prevent damage to paleontological resources.

PAL-2: Prior to any surface disturbing activities, an inventory of paleontological resources (fossils) may be required. Mitigation may be required upon the discovery of any vertebrate fossil or other scientifically-important paleontological resource. Mitigation of scientifically important paleontological resources may include avoidance, monitoring, collection, excavation, or sampling. Mitigation of discovered scientifically important paleontological resources might require the relocation of the disturbance over 100 meters. This and any subsequent mitigation work shall be conducted by a BLM-permitted paleontologist.

PAL-3: The lessee/operator shall bear all costs for inventory and mitigation (WO IM-2009-011).

PAL-4: A standard Education/Discovery stipulation for paleontological resource protection shall be attached to the land use authorization. The operator or its contractor is responsible for informing all persons who are associated with the project operations that Federal laws protect paleontological resources and they will be subject to prosecution for disturbing or destroying any vertebrate fossils or paleontological sites, or collecting any fossilized bones, tracks or any other vertebrate trace fossils from federal lands.

PAL-5: The Paleontological Resources Preservation Act (PRPA) [16 U.S.C. 470aaa] requires the lessee/operator to immediately suspend activities in the vicinity of a vertebrate fossil discovery, protect the discovery from damage and notify the BLM Authorized Officer of any paleontological resources discovered as a result of operations under this authorization. The Authorized Officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than 10 working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the Authorized Officer after consulting with the operator. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (1) following the Authorized Officer's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (2) following the Authorized Officer's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

PAL-5: Provide opportunities for education about and interpretation of paleontological resources deemed suitable for public use by virtue of their educational value, durability, and sustainability.

VISUAL RESOURCES

VRM-1: All new surface-disturbing projects or activities, regardless of size or potential impact, will incorporate visual design considerations during project design as a reasonable attempt to meet the Visual Resource Management (VRM) class objectives for the area and minimize the visual impacts of the proposal. Visual design considerations will be incorporated by:

- **a.** Using the VRM contrast rating process (required for proposed projects in highly sensitive areas, high impact projects, or for other projects where it appears to be the most effective design or assessment tool), or by
- **b.** Providing a brief narrative visual assessment for all other projects that require an environmental assessment or environmental impact statement.

c. Measures to mitigate potential visual impacts could include the use of natural materials, screening, painting, project design, location, or restoration (See Appendix H; BLM Handbook H-8431-1, Visual Resource Contrast Rating; or online at http://www.blm.gov/vrm, for information about the contrast rating process).

VRM-2: All new roads will be designed and constructed to a safe and appropriate standard, "no higher than necessary" to accommodate intended vehicular use. Roads will follow the contour of the land where practical. Existing oil and gas roads that are in eroded condition or contribute to other resource concerns will be brought to BLM standards within a reasonable period of time.

VRM-3: Impacts to dark night skies will be prevented or reduced through the application of specific mitigation measures identified in activity level planning and NEPA level review. These measures may include directing all light downward, using shielded lights, using only the minimum illumination necessary, using lamp types such as sodium lamps (less prone to atmospheric scattering), using circuit timers, and using motion sensors.

VRM-4: Any facilities authorized will use the best technology available to minimize light emissions

VRM-5: Any new permits/authorizations, including renewals, will be stipulated to use the best technology available to minimize light emissions as compatible with public health and safety.

VRM-6: Screening facilities from view and avoiding placement of production facilities on steep slopes, hilltops, and ridgelines.

VRM-7: Paint all facilities a color that best allows the facility to blend with the background (Operator-committed BMP).

VRM-8: Gravel of road color shall be similar to adjacent dominant soil colors.

VRM-9: Reduce impacts on visual resource management class II and class III areas.

VRM-10: Bury distribution powerlines and flow lines in or adjacent to access roads.

VRM-11: Repeat form, line, color, and texture elements to blend facilities with the surrounding landscape

VRM-12: All aboveground facilities including power boxes, building doors, roofs, and any visible equipment will be painted a color selected from the latest national color charts that best allows the facility to blend into the background.

VRM-13: Perform final reclamation recontouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.

VRM-14: To the extent opportunities are practicable, extreme visual contrast created by past management practices or human activities will be minimized. Examples include right-of-way amendments, mineral material sites, abandoned mines, and areas impacted by unauthorized off-road driving.

VRM-15: Reclaim unused well pads within one year.

VRM-16: Final reclamation of all oil and gas disturbance will involve re-contouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography and revegetating all disturbed areas

VRM-17: The use of submersible pumps will be strongly encouraged, especially in VRM Class I, II or III areas or any area visible by the visiting public.

VRM-18: The use of partial or completely below-grade wellheads will be strongly encouraged in high visibility areas as well as VRM Class I, II or III areas.

VRM-19: The placement of production facilities on hilltops and ridgelines will be prohibited where they are highly visible.

WILDLAND FIRE ECOLOGY AND MANAGEMENT

Fire Suppression

WFM-1: Resource Advisors and other applicable specialists shall be utilized to advise the Incident Commander and suppression resources on the natural resource values during the suppression effort.

WFM-2: Avoid applying fire retardant in or near drinking water sources.

WFM-3: Avoid the application of retardant or foam within 300 feet of a waterway or stream channel. Deviations from this procedure are acceptable if life or property is threatened.

WFM-4: Fire lines will not be constructed by heavy equipment within riparian stream zones. If construction is necessary due to threats to life or property, control lines shall terminate at the edge of the riparian zone at a location determined appropriate to meet fire suppression objectives based on fire behavior, vegetation/fuel types, and fire fighter safety.

WFM-5: For streams currently occupied by Greenback Cutthroat Trout, Colorado River Cutthroat Trout or other aquatic special status species, extractions of water from ponds or pools shall not be allowed if stream inflow is minimal and extraction of water will lower the existing pond or pool level.

WFM-6: Lands will be temporarily closed to other uses in areas where fire suppression is being implemented.

WFM-7: Stream flow shall not be impounded or diverted by mechanical means in order to facilitate extraction of water from the stream for fire suppression efforts.

WFM-8: If it is determined that use of retardant or surfactant foam within 300 feet of a waterway or stream channel is appropriate due to threats to life or property; alternative line construction tactics are not feasible because of terrain constraints, congested areas, or lack of ground personnel; or potential damage to natural resources outweighs possible loss of aquatic life, the unit administrator shall determine whether there have been any adverse effects to federally listed species. If the action agency determines that adverse effects were incurred by federally listed species or their habitats, then the action agency must consult with the Service, as required by 50 CFR 402.05, as soon as practicable.

WFM-9: Avoid whenever possible burning out unburned islands of native vegetation, specifically sagebrush communities.

WFM-10: Minimize/mitigate impacts to cultural resources and pristine vegetative communities.

WFM-11: Prior to use on BLM-CRVFO administered lands, thoroughly rinse to remove mud and debris from all fire suppression equipment from off-district or out of state and used to extract water from lakes, ponds, streams, or spring sources. Examples of this equipment are helicopter buckets, draft hoses, and screens. After cleaning the equipment, disinfect it to prevent the spread of invasive aquatic species. Do not rinse equipment with disinfectant solutions within 100 feet of natural water sources. CRVFO suppression equipment used to extract water from sources known to be contaminated with invasive aquatic species, as identified by the US Fish and Wildlife Service and Colorado Parks and Wildlife, also shall be disinfected beforehand on lands administered by the CRVFO.

WFM-12: Vehicle and equipment shall be washed before being assigned to fires to minimize the spread of noxious weeds. Larger fires with incident management teams assigned may need to have a weed wash station.

Emergency Stabilization and Rehabilitation:

WFM-13: Stabilize areas that have low potential to naturally revegetate and that have high wind and soil erosion potential. Treatments include the following:

a. Installing water bars and other drainage diversions, culverts along fire roads, dozer lines, and other cleared areas;
b. Seeding and planting to provide vegetative cover;
c. Spreading mulch to protect bare soil and discourage runoff;
d. Repairing damaged roads and drainage facilities;
e. Clearing stream channels of structures or debris that is deposited by suppression activities;
f. Installation of erosion control structures;
g. Installation of channel stabilization structures;
h. Fence or restrict areas to livestock and wild horse and burro grazing to promote success of natural revegetation or establishment of seeded species;
i. Lands may be temporarily closed to other uses during emergency stabilization and rehabilitation practices if activities inhibit treatment;
j. Repair or replace range improvements and facilities; and
k. Monitor emergency stabilization and rehabilitation treatments.

Fuels Management:

WFM-14: Construct fuel breaks or green strips to protect wildland-urban interface communities and provide for firefighter safety by using mechanical, chemical, biological, and prescribed fire treatment methods.

WFM-15: Construct fuel breaks and green strips in areas containing a good understory of native perennials in order to successfully compete with and deter the establishment and spread of annual species.

WFM-16: Seed fuels treatments in areas that do not have a good understory of desirable native perennials that can successfully compete with annual weed species.

WFM-17: Where practicable, use large-scale landscape planning to connect fuel treatments and avoid small piecemeal projects.

WFM-18: Plan for maintenance cycles and maintain fuel treatments to ensure effectiveness.

WFM-19: Prevent seeded species from being grazed during the first two growing seasons (>18 months) following seeding, or until site-specific analysis and/or monitoring data indicates that vegetation cover, species composition and litter accumulation are adequate to support and protect watershed values, meet vegetation objectives and sustain grazing use

WFM-20: Provide fire prevention and mitigation outreach information and education to communities within the CRVFO.

WFM-21: Use fuels treatment to meet fire regime condition class objectives. Implement fuels treatments actions that may include, but are not limited to:

- Mechanical treatments, including mowing, weed-whacking, chopping (roller chopper), chipping, grinding (hydro-ax), chaining, tilling, and cutting.
- Manual treatments, including hand cutting (chainsaw/handsaw) and hand-piling.
- Prescribed fire, including pile and broadcast burning.
- Chemical spraying or biological treatments, such as insects or goats.
- Seeding, including aerial or ground application.

LANDS WITH WILDERNESS CHARACTERISTICS

See best management practices listed in Appendix F - Management and Setting Prescriptions for Lands Managed for the Protection of Wilderness Characteristics.

CAVE AND KARST RESOURCES

CAV-1: Implement a permit program as needed to meet management objectives and setting prescriptions. (e.g., La Sunder Cave).

Also see best management practices listed in Appendix H - Management and Setting Prescriptions for Caves.

WILD AND SCENIC RIVERS

WSR-1: To the extent possible under existing legal authorities (e.g., FLPMA, Clean Water Act, Endnagered Species Act, and Archaeological Resources Protection Act), the BLM's policy goal for eligible and suitable rivers is to manage their free-flowing condition, water quality, tentative classification, and any outstandingly remarkable values to ensure a decision on suitability can be made for eligible rivers; or in the case of suitable rivers, until Congress designates the river or releases it for other uses. All eligible and suitable rivers will be managed in accordance with BLM BLM Manual 6400, Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management (BLM 2012).

WILDERNESS STUDY AREAS

WSA-1: All Wilderness Study Areas will be managed in accordance with BLM Manual 6330 – Management of Wilderness Study Areas.

References:
BLM 2012. Management of Wilderness Study Areas, Manual 6330. BLM. July 2012.

FORESTRY

FOR-1: No fuel wood cutting of live trees will be allowed for cottonwood, willow, alder; unless resource objectives allow otherwise.

FOR-2: No forestry harvest or collection of products will be allowed during the winter closure timing restraints (November 30 – May 1).

FOR-3: Trees marked for wildlife protection and/or "Seed Tree Do Not Fall" will not be allowed to be harvested for any type of forestry products.

FOR-4: Harvest plans will be completed on all commercial sales within woodlands and forests, showing access roads, decks and skid trail locations. Approval of these plans by the BLM Authorized Officer is required before harvest can start.

FOR-5: The closure of new roads will be considered and planned for during sale preparation in accordance with existing policy.

FOR -6: Clear cuts will be considered for use in the pinyon-juniper and aspen types in critical big game winter ranges and other areas where economically feasible.

FOR -7: Clear cuts will be considered for use in restoring aspen sites.

FOR -8: Cuts that thin the pinyon-juniper canopy cover to 20 percent or less will be favored for use in bighorn sheep ranges. These cuts will focus on the smaller trees in the stand,

FOR -9: Large conifer seed trees (three to seven trees per acre) will be left where practical as wildlife shelter on south facing slopes of big game winter ranges to ensure the succession of quality snags.

FOR -10: An average of three to seven trees per acre of the largest nonhazardous snags, particularly those adjacent to openings and open water will be left on commercial sale areas.

FOR-11: Sale areas with less than 15 percent ground cover in the understory on critical deer and elk winter ranges will be seeded using a mixture of grasses, forbs, and shrubs and will be paid for with wildlife funds.

FOR-12: Minimum of 180 year rotation will be allowed for pinyon-juniper stands. Other species will be managed on a rotation of sufficient length to produce cavity trees for flickers and small owls.

FOR-13: A minimum 50 foot buffer will be maintained along all riparian areas.

FOR-14: Snags with existing cavities or nests will be priority for retention.

FOR-15: Snag diameter for retention will be the largest class on site and will be retained in clusters if possible.

FOR-16: If site potential allows, will retain 5-7 snags per acre, preferably in a clumped configuration.

FOR-17: If possible, will retain at least 15 live trees per acre for future snag recruitment. Recruitment snags will not have to be structurally superior; live tree with forked and broken tops may be preferred.

FOR-18: Do not disturb or destroy active or inactive nests of raptors which are reused.

FOR-19: Avoid heavy equipment use in stands of cottonwood, willow, alder. If heavy equipment use is necessary, allow on a case by case basis and mitigate for adverse impacts.

FOR-20: Allow dead and down collection of cottonwood for personal use.

FOR-21: Protect seed and important wildlife habitat trees in pinyon-juniper stands.

FOR-22: Allow removal of pinyon-juniper encroachment utilizing mechanical, biological, and chemical treatments. Allow tree harvesting for Christmas trees and transplants other woodland products and biomass reduction.

FOR-23: Minimize disturbance to the soil such that surface runoff does not result in sediment transport into waterbodies. Concentrate skidding on as few skid trails as needed.

FOR-24: Limit primary skid trails to 10 percent of the total working area.

FOR-25: Avoid widespread or random skidding patterns with repeated passes.

FOR-26: Minimize placement and use of skid trails in ephemeral drainages. If skid trails must be within or cross an ephemeral drainage, additional BMPs are needed to protect water quality.

FOR-27: Minimize the extent of gouges or trenches upon the ground surface that are created by the skidding of trees or logs.

FOR-28: On sloping terrain, skid trails shall follow along the land contours and shall be kept to 25 percent grade or less when practical.

FOR-29: Establish decks at locations where soil disturbance is minimized.

FOR-30: Maintain as close to normal (pre-construction) streamflow by maintaining depth, width, gradient and capacity of the stream channel at the crossing.

FOR-31: Perform construction, installation, and removal work during low-water flow if circumstances allow.

FOR-32: Stabilize the approachways and/or stream crossing locations so sediment is not transported into the stream.

FOR-33: Approaches to the stream are relatively flat to better control runoff.

FOR-34: The crossing can be installed at a right-angle (90 degrees) to the stream channel so crossing distance is minimized.

FOR-35: Any trees removed during these processes will be purchased by the applicant prior to construction. The applicant is responsible for a per-cord fee.

FOR-36: Apply forest management practices and harvesting to improve other resource values and reduce hazardous fuels in cooperation with forest management activities on adjacent private lands.

Guidelines for Christmas Tree and Firewood Harvesting:

FOR-37: Vehicle use is restricted to existing roads and trails. Do not drive off road.

FOR-38: Do not damage adjacent trees.

FOR-39: When cutting down standing trees, cut the stump 12 inches or less, or as close to the ground as possible.

FOR-40: Scatter lopped branches at least 50 feet from the stump.

FOR-41: Do not top a larger tree to obtain a Christmas tree.

F-42: Do not harvest any trees within 100 feet of a spring or creek unless trees are identified for selective removal to meet resource objectives.

FOR-43: No harvesting when soils are saturated to a depth of 3 inches to prevent damage to roads.

FOR-44: CRVFO closed to firewood harvesting on November 30. Firewood harvesting reopens in the spring based on road conditions.

Pinyon-Juniper Woodlands:
FOR-45: Use planned and unplanned fire, and mechanical treatments, as necessary to create a mosaic of age-classes within pinyon and juniper woodlands to mimic the natural range of variability, increase understory production, and resistance to erosion.

Other Forest Types:
FOR-46: Stimulate sprouting and sapling establishment in decadent aspen patches throughout the CRVFO using treatments such as planned and unplanned fire and mechanical methods.

FOR-47: Apply either even- or uneven-aged silvicultural systems to stands as appropriate to cover type. Use silvicultural methods, including thinning and commercial harvests, where appropriate, to achieve age-class diversity across the landscape and reduce the risk and spread of disease vectors.

FOR-48: Use planned and unplanned fire, and mechanical, chemical, and biological treatments as necessary to reduce the risk or spread of disease vectors and to increase the resilience of stands to beetles and disease.

LIVESTOCK GRAZING

GRZ-1: Follow the Grazing Guidelines established along with the Colorado Standards for Rangeland Health.

GRZ-2: Usually it is necessary to protect seedings from grazing for one full year and through the growing season of the second year. Some seedings established during adverse weather cycles may need protection for a longer period.

GRZ-3: New fences shall be constructed to BLM standards allowing for the appropriate wildlife passage. Fences constructed will comply with applicable wildlife fence standards, such as those described in BLM Handbook H-1741-1, Fencing (BLM 1989).

GRZ-4: Bird and wildlife ramps shall be installed in all troughs.

GRZ-5: Access routes to functioning range improvements shall be retained to allow for periodic maintenance and prevent cross country travel.

GRZ-6: Continue to maintain range improvement projects to support proper livestock management including optimal distribution.

GRZ-7: Rangeland and vegetation monitoring will be conducted to detect changes in grazing use, trend, and range conditions. These data will be used to support and direct grazing management decisions. These efforts will help ensure that livestock grazing meets objectives for rangeland health and resolves conflicts with wildlife or other resources.

GRZ-8: Grazing management decisions will be based on inventory and monitoring data, both short-term and long-term, which will be jointly developed by grazing permittees and the appropriate federal land management agency.

GRZ-9: All water development activities for livestock grazing use that exceed the minimum depletion level established by US Fish and Wildlife Service must comply with all US Fish and Wildlife Service fees and prescribed mitigations to offset water depletion in the Colorado River.

GRZ-10: Surface-disturbing activities will be coordinated with livestock grazing permittees to minimize the effects of the surface disturbance on other approved operations. To the maximum extent practicable, this effort will include consulting on scheduling of operations to mutually minimize effects.

GRZ-11: Any damage to the function of range improvements (e.g., fence damage, cattle guard cleaning, livestock loss) from other approved operations will be repaired immediately or remedied by the operator causing the damage.

GRZ-12: Well pads, pits, and other facilities that could be hazardous to livestock will be fenced to keep livestock out and the fences maintained in functioning condition.

GRZ-13: Development of springs and seeps or other projects affecting water and associated resources shall be designed to maintain the associate riparian area and ensure attainment of standards.

GRZ-14: Disturbance to established rangeland study sites shall be avoided to provide for the continuation of monitoring efforts which involves comparisons of data to previous records of that site.

GRZ-15: Facilities shall be constructed a minimum of 0.125-mile from livestock gathering spots such as water sources and gathering facilities to prevent disruption of the use of these facilities and potential damage to the facility by livestock.

GRZ-16: Exclosures may be established in areas where the vegetative potential of the area is questionable or to compare the effectiveness of grazing management.

GRZ-17: Livestock grazing could be used as an intensively managed prescriptive grazing practice to control cheatgrass and noxious or invasive weeds.

GRZ-18: Use grazing systems that contain rotation, deferment, and rest to produce a mosaic of habitat patches and increases the density, height and distribution of native plants.

GRZ-19: Rotate livestock use areas year to year – avoid grazing in the same place at the same time each year.

GRZ-20: Avoid re-grazing the same plants in one growing season.

GRZ-21: Adjust grazing seasons to benefit both warm and cool season grass species by providing periodic rest from grazing for each type.

GRZ-22: Avoid grazing an area during the spring and fall period in one year's time.

GRZ-23: Allow for adequate litter cover following grazing use to protect soil surface and enhance soil moisture retention.

GRZ-24: For spring grazing ensure livestock are removed early enough so that sufficient soil moisture remains for plant recovery.

GRZ-25: Allow for rest/recovery periods before or after grazing during critical growth periods. Recovery shall include the production of seed to allow for the regeneration of desirable plant species.

GRZ-26: Occasional grazing use during the dormant season will provide rest during the growing season and will allow plants to recover.

GRZ-27: Adjust intensity, timing and/or duration of grazing during periods of drought.

GRZ-28: Manage livestock grazing, including dormant season use, to insure adequate residual grass cover remains when soil moisture or wildlife habitat are concerns.

GRZ-29: Proper utilization allows stubble for root and crown protection, litter accumulation for organic matter contribution to the soil, cover and habitat for wildlife and forage availability for grazing animals utilizing the area. Generally utilization levels shall be based upon recovery periods and other resource objectives. Suggested utilization guidelines would be:

a. In areas Not Meeting Land Health Standards and cattle grazing is a causative factor, limit utilization on key species to 30% during the critical growth period and 40% during the dormant season.
b. In areas Meeting Land Health Standards limit utilization on key species to 40% during the critical growth period and 50% during the dormant season.
c. If wildlife/livestock conflicts exist annual utilization would be read before the next seasons growth begins to account for all uses and demands on the plants.
d. The exception to these guidelines is if the permittee can convince the authorized officer that they have the knowledge, ability and commitment to implement a grazing system that should result in improvements to the ecosystem.

GRZ-30: Limit use in areas of valuable woody plants during times when they are selected.

GRZ-31: Avoid the following grazing management practices:
a. Long seasonal use with no recovery time
b. Heavy use - stresses plants,
c. Little or no re-growth before winter - little stubble for root crown protection

d. Use at the same time every year - repeating the stress
e. No rest or growing season recovery - little recovery with long seasons of use
f. Little or ineffective herding
g. Salt placed in the same locations year after year
h. Livestock left behind after pasture moves
i. Grazing during the critical growth period year after year

GRZ-32: When using livestock to control noxious or invasive weeds, match animal dietary preference or tolerance to the target species.

GRZ-33: Use the target weed's phenology when developing a grazing strategy.

GRZ-34: Manage heavy grazing on target weed species to account for any intermixed desirable species.

GRZ-35: Conduct vegetation manipulation and other range improvement projects, including grazing management practices, to achieve the Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado and to improve the quantity and quality of forage available for livestock and wildlife.

Vegetation/Riparian Zone Grazing Management Guidelines:

GRZ-35: To reduce negative impacts to grazing, determine the critical period(s) of a riparian site, and then limit grazing during the critical period(s) to no more often than once every three or four years. Critical periods and impacts are likely to be either in late spring-early summer, when stream banks are more easily broken down by trampling; or late summer-early fall, when excessive browsing can damage vegetation. Each site has its own critical period that shall be individually determined. Important critical period variables are soil moisture, plant species composition, animal behavior patterns. Site may be grazed every year if use does not occur during the critical period(s). Extended periods of rest or deferment from grazing may be needed to enable recovery of badly degraded sites. Graze earlier in the season when cattle use uplands. (Mosley et al. 1997)

GRZ-36: To maintain stream bank stability, limit cattle access to surface water when adjacent stream banks and shorelines are overly wet and susceptible to trampling and sloughing. Stream bank trampling can often be reduced by capitalizing on the natural foraging behavior of cattle. Cattle generally avoid grazing excessively wet sites or in cold-air pockets. Cattle seek out wind-swept ridges, and they graze on upland forage when it is more palatable than forage in riparian areas. Avoid hot season grazing of riparian areas. (Mosley et al. 1997)

GRZ-37: To graze a site more than once per growing season, moisture and temperature conditions shall be conducive to plant growth. For such sites, allow a recovery period of at least 30 to 60 days, depending on vegetation type, before re-grazing within the same growing season. Grazing more often and for shorter periods-that is, 3 weeks or less at a time-is preferable to fewer and longer grazing periods. (Mosley et al. 1997)

GRZ-38: To control the timing, frequency, and intensity of cattle grazing, consider creating smaller riparian pastures with similar, or homogenous, features. Adjusting timing, frequency, and intensity of grazing in individual pasture units is more important than adopting a formalized grazing season. (Mosley et al. 1997)

GRZ-39: To protect stream banks, prevent cattle from congregating near surface waters. Fencing, salting, and herding work best. Provide remote watering systems for cattle. Manage the riparian area as a separate and unique pasture. Inappropriate cattle grazing will usually first be evidenced by excessive physical disturbance to stream banks and shorelines. (Mosley et al. 1997)

GRZ-40: On riparian areas that are determined to be non-functioning or functioning at risk as a result of livestock grazing impacts, limits of bank disturbance will be determined and included within the *Terms and Conditions* of the Grazing Permit.

GRZ-41: In general, utilization standards in riparian areas should be no more than 30% use of current year's growth on woody species and a minimum of 4 inches of stubble height on key species shall remain at the end of the grazing period.

GRZ-42: To protect stream banks, discourage trailing up and down the channel by placing logs across trails, perpendicular to the stream channel.

GRZ-43: Adjust intensity, timing and/or duration of grazing during periods of drought.

References:

BLM Handbook H-1741-1, Fencing (BLM 1989)

Mosley, J.C., P.C. Cook, A.J. Griffis, and J. O'Laughlin. 1997. Guidelines for Managing Cattle Grazing in Riparian Areas to Protect Water Quality: Review of Research and Best Management Practices Policy. Report No. 15. University of Idaho, Moscow, ID. December 1997.

RECREATION

REC-1: Special Recreation Permits will contain noxious weed management stipulations (e.g., pre-event inventories to avoid infested areas, event management to avoid or isolate activities that could cause weed introduction or spread, monitoring and treatment of infestations exacerbated by the activity, and other appropriate noxious weed management stipulations).

REC-2: Promote the seven standard principles of Leave No Trace outdoor ethics through print and electronic media, and through personal communications with recreationists participating in non-motorized recreation activities on BLM-managed public lands. (www.lnt.org)

REC-3: Promote the principles of Tread Lightly outdoor ethics through print and electronic media, and through personal communications with recreationists participating in recreation activities on BLM-managed public lands. (www.treadlightly.org)

REC-4: Apply *Recreation Management Guidelines to Meet Public Land Health Standards on BLM Lands in Colorado. Website:* http://www.blm.gov/co/st/en/BLM_Information/newsroom/2000/recguidefnr/guide_final.html.

REC-5: Apply *Guidelines for a Quality Built Environment*. Website: http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/recreation_images/national_programs/VRM.Par.62809.File.dat/GQBE_WEB.pdf.

REC-6: Route design, construction and maintenance will follow: BLM guidelines, guidelines established in the Gold Book (BLM 2007) and technical recommendations of partner groups (e.g. International Mountain Bicycling Association (IMBA), Volunteers for Outdoor Colorado - Crew Leader Manual, Backcountry Horsemen, National Off-Highway Vehicle Conservation Council (NOHVCC)).

LANDS AND REALTY

RLT-1: Power lines shall be constructed in accordance to standards outlined in "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996" (Avian Power Line Interaction Committee 2006). Right-of-way applicants shall assume the burden and expense of proving that proposed pole designs not shown in the above publication are "raptor safe." Such proof shall be provided by a raptor expert approved by the BLM Authorized Officer.

RLT-2: Rights-of-way and other lands and realty authorizations, including power lines, pipelines, transmission corridors, energy development sites and related development, and gravel pits, will contain noxious and invasive plant management terms or stipulations for all ground-disturbing actions. These will include conducting a pre-disturbance noxious weed inventory, designing to avoid or minimize vegetation removal and weed introduction or spread, managing weeds during the life of the right-of-way or authorization to prevent or minimize weed introduction or spread, abandoning the right-of-way or authorization to establish competitive vegetation on bare ground areas, and monitoring revegetation success and weed prevention and control for a reasonable number of years.

RLT-3: Rights-of-way will be constructed to avoid physical damage to range improvements and rangeland study areas.

RLT-4: The Holder shall notify the BLM Authorized Officer at least 48 hours prior to the commencement construction, reclamation, maintenance, or any surface-disturbing activities under this grant. LR

RLT-5: Copies of the right-of-way grant with the stipulations shall be kept on site during construction and maintenance activities. All construction personnel shall review the grant and stipulations before working on the right-of-way or permitted area.

RLT-6: All facilities shall be labeled with the authorization number, operator, and contact information.

RLT-7: No signs or advertising devices shall be placed on the premises or on adjacent public lands, except those posted by or at the direction of the BLM Authorized Officer.

RLT-8: The Holder shall promptly remove and dispose of all waste caused by its activities. The term "waste" as used herein means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, petroleum products, ashes, and equipment. No burning of trash, trees, brush, or any other material shall be allowed.

RLT-9: The Proponent shall notify all existing right-of-way holders in the project area prior to beginning any surface-disturbance or construction activities. The Holder shall obtain an agreement with any existing right-of-way holders or other parties with authorized facilities that cross or are adjacent to those of the holder to assure that no damage to an existing right-of-way or authorized facility will occur. The agreement(s) shall be obtained prior to any use of the right-of-way or existing facility.

RLT-10: The Holder shall participate in the formation of a Road User's Association for the road if new rights-of-way are granted for use of the existing road. All new users will be required to join the association.

RLT-11: The Holder will provide a performance bond for the authorized facility, acceptable to the BLM Authorized Officer, in the amount of $(_) that must be maintained in effect until restoration of the right-of-way has been accepted by the BLM Authorized Officer. The bond shall be furnished by the holder within 30 days of signing the grant (_) and shall be applied to all additional authorizations associated with the project as necessary.

RLT-12: Incorporate conditions of approval and mitigation measures from the Final Programmatic EIS on Wind Energy Development on BLM-administered Lands in the Western US, as applicable (BLM 2005).

RLT-13: Incorporate conditions of approval and mitigation measures from the Solar Energy PEIS, as applicable (*pending completion of Solar PEIS*).

RLT-14: All construction activities shall be confined to the minimum area necessary. The exterior boundaries of the construction area shall be clearly flagged prior to any surface-disturbing activities.

RLT-15: Existing roads will be used wherever possible. Additional roads shall be kept to the minimum. Route locations must be approved by the BLM prior to construction.

RLT-16: When blasting is necessary, the following precautions will be used:

a. In areas of human use, blasting blankets will be used.
b. Landowners or tenants in close proximity to the blasting will be notified in advance of the blasting so that livestock and other property can be adequately protected.
c. Access to the blasting area will be restricted by construction personnel stationed at each end of the area to be blasted.
d. Blasting within 0.25-mile of federally-owned or controlled springs and flowing water wells must be approved in writing by the area manager.
e. No blasting will be permitted within 0.25-mile of historic trails, natural areas, identified archaeological sites, and recreation areas.
f. Powder magazines will be located out of sight or at least 0.5-mile from roads. Loaded shot holes will not be left unattended. Approval from the area manager will be obtained for the magazine locations.

RLT-17: Roads will be constructed and maintained to BLM road standards (BLM Manual 9113 [BLM 2012]). All vehicle travel will be within the approved driving surface.
Best Management Practices for Pipeline Projects

RLT-18: A preconstruction field conference shall be requested by the grantee at least five working days prior to any construction activities unless otherwise agreed upon by the BLM Authorized Officer.

RLT-19: Once the pipeline is constructed, the grantee/operator shall restore the existing roadway to meet or exceed conditions prior to construction. The preconstruction width of the driving surface shall also be restored and erosion control structure installed subject to approval of the BLM Authorized Officer. The grantee/operator shall be responsible for road maintenance from the beginning to completion of operations. This may include, but not be limited to, blading the roadway, cleaning ditches and drainage facilities, dust abatement, or other requirements as directed by the BLM Authorized Officer.

RLT-20: Construction width shall include the existing road. The pipeline shall be located two to three feet from the edge of the ditch along the existing road. The existing road shall be on the working side of the trench.

RLT-21: The grantee shall accomplish the crossing of the pipeline owned by (company name) in accordance with an agreement between the grantee/operator.

RLT-22: Pipeline location warning signs shall be installed within five days of construction completion. Each sign shall be permanently marked with the right-of-way serial number.
Geophysical Exploration

RLT-23: The operator will furnish a map with the Notice of Intent showing approximate line to be used. A map will also be filed with the Notice of Completion showing the completed line. The map will be of a minimum scale of 0.5-inch equals 1.0 mile.

RLT-24: Rehabilitation of disturbed areas is to be done concurrent with the geophysical operations.

RLT-25: Blasting or vibrating within 0.25-mile of federally-owned or controlled springs and flowing water wells or cultural resource sites must be approved in writing by the area manager.

RLT-26: Plugging of drill holes will conform to the Colorado Reclamation Standards Abandoned Drill Holes Act. Drill hole cuttings will be returned to the hole. LR

RLT-27: No blading or other dirt work will be allowed without written permission from the area manager.

RLT-28: Standard Terms and Conditions described in BLM Handbook H-3150-1: Onshore Oil and Gas Geophysical Exploration Surface Management Requirements (BLM 1994 Rev. 2007).

RLT-29: Coordinate with the Colorado Parks and Wildlife early in the sale process on proposals to sell public land encumbered by a small capacity wildlife water development.

RLT-30: Encourage wind energy development in acceptable areas in accordance with current policy and when consistent with resource objectives and goals.

References:

BLM. 2012. H-9113-1 Road Design Handbook. Bureau of Land Management, Washington, D.C.On-line: http://web.blm.gov/nstc/eat/pdf/Final%20H-9113-1.pdf

BLM. 1994. BLM Handbook H-3150-1: Onshore Oil and Gas Geophysical Exploration Surface Management Requirements. BLM, Washington, DC. Rev. 2007.

BLM. 2005. Bureau of Land Management Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States. BLM, Washington, DC. June 2005.

Avian Power Line Interaction Committee. 2006. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute, Avian Power Line Interaction Committee, and the California Energy Commission. Washington, DC, and Sacramento, CA.

MINERALS AND ENERGY

Actions involving minerals and energy are governed by:

- Minerals Leasing Act of 1920 (30 U.S.C 181 *et seq*);
- Federal Oil and Gas Royalty Management Act (30 U.S.C. 1718(b));
- Federal Onshore Oil and Gas Leasing Reform Act (30 U.S.C. 226(g));
- 43 CFR 8900 et seq.
- Federal On Shore Orders 1-7
- 43 CFR 3809 Regulations (Locatable Minerals Management)

The Intermountain Oil and Gas BMP project's web site presents current BMPs specific to Colorado http://www.oilandgasbmps.org/index.php.

Geophysical Exploration:

MIN-1: If operations open an existing fence, temporary gates will be installed for use during the course of operations, or the fence will be immediately repaired. On completion of operations, fences will be restored to their original condition or better.

MIN-2: When saturated soil conditions existing on access roads or location, or when road rutting becomes deeper than 3 inches, construction shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils, roads and locations.

MIN-3: For geophysical operations, specialized low surface impact equipment (wide- or balloon-tired vehicles, all-terrain vehicles) or helicopters may be used for activities in off-road areas to protect fragile soils and or other resource values.

MIN-4: Prohibit the use of subsurface explosives and vibrosis buggies within 0.25 miles of all spring sources and perennial streams.

MIN-5: Powder magazines will be located at least a mile from traveled roads, unless otherwise authorized after analysis or review. Loaded shot holes and charges will be attended at all times.

MIN-6: Materials or equipment related to project activities (e.g., trash, flagging, lath) will be removed to an authorized disposal site. General Surface Uses

MIN-7: Project materials which could be a hazard to public health, safety or resource values will be stored in appropriate secondary containment. No oil or lubricants will be drained onto the ground surface. General Surface Uses

MIN-8: Shot-hole cuttings will be returned to the hole, or an alternative plan will be submitted for BLM approval.

Reducing Fluid Mineral Development Footprint
MIN-9: Surface disturbing actions will be sensitive to natural resource protection. When surface disturbance in sensitive areas is unavoidable, they will be minimized to the greatest extent practicable, especially near drainage features and on soils mapped as being saline (> 8 mmhos/cm).

MIN-10: Utilities such as gas and water lines, power lines and roads will be located in common corridors where practicable.

Administrative / General and Planning:
MIN-11: Consider site specific soil and vegetative characteristics and reclamation potential in project design and layout.

MIN-12: Design and construct energy service roads to a safe and appropriate standard, no higher than necessary to accommodate their intended use.

MIN-13: Locate and construct roads and other linear facilities to follow the contour of the landform or mimic lines in the vegetation.

MIN-14: A pre-construction meeting will be held with the BLM before and to facilitate implementation of plans and ensure compliance with stipulations or conditions of approval. The BLM will be notified at least 48 hours prior to construction or reclamation work.

MIN-15: By November 1 each year, companies will provide georeferenced spatial data depicting as-built locations of all facilities, wells, roads, pipelines, power lines, reservoirs, discharge points, and other related facilities to the BLM for all Master Development Plans where construction and development have been completed.

MIN-16: Where winter range areas are not protected by lease stipulations, operations such as construction, drilling, completion, work-overs and other intensive activities will be avoided from January 1 to March 1 to minimize impacts to wintering big game.

MIN-17: Before activities take place, every pad, access road, or facility site will have an approved surface drainage plan (storm water management plan) for establishing positive management of surface water drainage, to reduce erosion and sediment transport. The drainage plan will include adaptive BMPs, monitoring, maintenance and reporting. BMPs may include run-on/run-off controls such as surface pocking or revegetation, ditches or berms, basins, and other control methods to reduce erosion. Pre-construction drainage BMPs will be installed as appropriate.

MIN-18: Before surface disturbance, agreements will be obtained with all existing rights-of-way holders, authorized users and pipeline operators affected by permitted activities. If Agreement cannot be reached, the operator will comply with the law or regulations.

MIN-19: Disclosure of hydraulic fracture fluids per COGCC rule 205A will be done using FracFocus.org 30 days following the conclusion of the hydraulic fracturing treatment and in no case later than 90 days after the commencement of such hydraulic fracturing treatment.

Pre-Construction:

MIN-20: Stakes, snow fence or flagging will be installed to mark boundaries of permitted areas of disturbance, including pre-construction BMPs and soils storage areas and be maintained in place until final construction cleanup is completed.

MIN-21: Pre-construction drainage BMPs will be installed as appropriate, per the approved surface/storm drainage water management, plan to protect stream drainages and to reduce erosion and sediment transport.

MIN-22: Surveys for raptor nests, sensitive plant and animal species and cultural resources will be conducted prior to construction activities following BLM survey standards. Survey results will be submitted to the BLM for analysis and recommendations before project approval.

Construction:

MIN-23: All routes shall be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features (BLM 2009b) or where appropriate BLM Manual Section 9116 standards for primitive roads. For drainage crossings, culverts should be sized for the 50 year storm event with no static head and to pass a 100-year event without failing. Site specific conditions may warrant BLM to require designs for larger events (e.g. 75-100 year storm events). Large culverts and bridges shall be designed and constructed per BLM Manual 9112 (large culverts and bridges) (BLM 2009a). Large culverts and bridges shall be designed to pass a 100-year storm event (minimum).

MIN-24: As detailed in the site plan for surface/storm water management, drainage from disturbed areas will be confined or directed to minimize erosion, particularly within 100 feet of all drainages. No runoff, including that from roads, will be allowed to flow into intermittent or perennial waterways without first passing through sediment-trapping mechanisms such as vegetation, anchored bales or catchments.

MIN-25: Topsoil stripping will include all growth medium present at a site (following initial clearing of large trees, etc.), as indicated by color or texture. Stripping and storage depth may be specified during the onsite inspection. All stripped topsoil /growth medium will be salvaged, segregated and stored in a manner that extends biological viability and protects it from loss. Topsoil and all growth medium will be replaced prior to seedbed preparation. No topsoil will be stripped or segregated when soils are saturated or frozen below the stripping depth.

MIN-26: Access roads requiring construction with cut and fill will minimize surface disturbance and consider the character of the landform's contours, visual contrasts, the cut materials, the depth of cut, where the fill material will be deposited and other resource concerns.

MIN-27: Fill material will not be cast over hilltops or into drainages without BLM approval.

MIN-28: When saturated soil conditions existing on access roads or location, or when road rutting becomes deeper than 3 inches, construction shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils, roads and locations.

MIN-29: Construction activities at drainage crossings (e.g., burying pipelines, installing culverts) will be timed to avoid high flow conditions. Construction activities that affect stream flow will consist of either a piped stream diversion or the use of a coffer dam and pump to divert flow around the disturbed area.

MIN-30: When activity in a wetland is unavoidable, the operator will reduce impacts through the use of oak or HDP mats and will restore all temporarily disturbed wetlands or riparian areas, consulting with the BLM to determine appropriate mitigation, including verification of native plant species to be used in restoration.

MIN-31: All stream crossings affecting perennial streams or streams supporting riparian habitat shall be professionally engineered (design, construction, and maintenance).

MIN-32: Where the access road crosses small drainages and intermittent streams not requiring culverts, low water crossings shall be used. The road will dip to the original streambed elevation of the drainage and the crossing will prevent any blockage or restriction of the existing channel. Material moved from the banks of the crossing will be stockpiled nearby for later use in reclamation. Gravel, riprap, or concrete bottoms may be required in some situations.

MIN-33: All pipeline welds within 100 feet of a perennial stream will be x-rayed to prevent leakage into the stream. Where pipelines cross streams that support Federal or State-listed threatened or endangered species or BLM-listed sensitive species, additional safeguards such as double-walled pipe, and remotely-actuated block or check valves on both sides of the stream may be used

MIN-34: Water from hydrostatic testing of pipelines will be filtered of sediments prior to discharge. Energy dissipating methods such as straw-bales, wattles, and vegetative buffers will be in place before any discharge of water.

MIN-35: Baseline information on channel characteristics and riparian vegetation present must be documented before actions are permitted to disturb riparian areas and the stream channel.

Drilling:

MIN-36: Pits that may contain liquid, such as reserve pits, produced water pits, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits, will install and maintain netting to prevent entry or use by migratory birds. They will be fenced on three sides before drilling activity and closed off on the fourth side after drilling is completed.

MIN-37: If any pit that may contain liquid is constructed with a slope steeper than 3:1, or if the pit is lined, escape ramps will be installed every 50 feet along the pit slope and at each corner to allow escape by livestock and wildlife

MIN-38: Fluids will be confined to pits and all pits that may contain liquids will be lined to protect groundwater. Liners will be maintained in good condition, with no tears or holes, until they are removed when the reserve pit is closed.

MIN-39: Pits will be constructed so that water will not run into them. Fluid levels will be maintained below 2 feet of the lowest point of containment.

Utilization and Production:

MIN-40: Operations will not damage, disrupt or interfere with water flows and/or improvements associated with springs, wells, or impoundments.

MIN-41: Regularly scheduled road maintenance will include, but not be limited to, crown or slope reconstruction, clean-out of ditches, culverts and catchments, replacement of the road surface and dust abatement.

MIN-42: Well pads and facilities will be kept free of unnecessary equipment, trash and other materials not in current use.

MIN-43: Pits will be promptly drained, tested, closed and reclaimed according to local state and federal regulations.

MIN-44: Dust from vehicular traffic, equipment operations, or wind events will be controlled as needed. No application of surfactants or dust agents will proceed without BLM approval. In areas with soils mapped as Mancos shale, application of water on native road surfaces will be limited, to minimize mobilization of selenium. In such areas, alternate dust abatement measures such as proper road surfacing and maintenance, and speed limits will be used, subject to BLM approval.

MIN-45: Noise will be minimized by methods such as closed compressor buildings to comply with COGCC standards for noise.

MIN-46: Pipeline warning signs permanently marked with the operator's and owner's names (emergency contact) and purpose (product) of the pipeline will be installed within five days of construction completion and before use of the pipeline for transportation of product.

MIN-47: All production equipment with a chimney, vent, or stack shall be fitted with a device to prevent birds from entering or perching on the chimney, such as an excluder cone or equivalent.

MIN-48: Production facilities will be located and arranged to facilitate safety and maximize areas to be reclaimed.

MIN-49: All above ground facilities should be painted a natural color selected from the BLM Standard Environmental Color Chart to minimize contrast with adjacent vegetation and/or rock outcrops. Color(s) should be selected in the field at the proposed project location and should be planned for the season with the greatest number of viewers. Selected color(s) should be one to two shades darker than those naturally occurring in the background landscape (this will also help with the effects of fading over time). The operator may need to paint drill rig anchors and those minor working tips and edges of production facilities that are subject to OSHA safety requirements a red, yellow, or orange color.

MIN-50: Standard secondary containment shall hold 110% of the capacity the largest single tank it contains and be impervious to any oil, glycol, produced water, or other toxic fluid for 72 hours. Earthen berms must be compacted and of fine material that will prevent seepage of any spill to surrounding area.

MIN-51: All tanks with a capacity of ten (10) barrels or greater shall be labeled or posted with the following information: A. Name of operator; B. Operator's emergency contact telephone number; C. Tank capacity; D. Tank contents; and E. National Fire Protection Association (NFPA) Label. Smaller chemical storage shall be labeled with contents and NFPA label.

MIN-52: All liquids management hoses will be stored inside secondary containment when not in use.

MIN-53: All open top tanks, catchments or secondary containment vessels will be equipped with sturdy metal screening to prevent access to wildlife of all sizes to prevent entrapment and drowning of small wildlife.

Site Stabilization, Reclamation and Monitoring:

MIN-54: Road and pipeline reclamation, including seedbed prep and seeding of temporarily disturbed areas will be completed within 30 days following completion of construction.

MIN-55: Following completion of pad construction, topsoil storage piles, stormwater control features, and cut-and-fill slopes will be temporarily seeded, to stabilize the materials, maintain biotic soil activities, and minimize weed infestations. When this is not feasible, disturbed surfaces must be stabilized using other methods like hydro-mulch or erosion matting while vegetation is establishing. Seedbed preparation is not generally required for topsoil storage piles or other areas of temporary seeding.

MIN-56: Interim reclamation includes recontouring and revegetating the entire portion of the disturbed area except that part of the well pad needed for production activities.

a. It will be completed within six months following completion of the last well planned for the pad or after a year has passed with no new wells drilled on the pad. All areas unnecessary to production activities will be revegetated, including the area within the remaining rig anchors. In special cases, an exception to this will be requested.
b. Before interim reclamation is scheduled, the operator will meet with BLM to inspect the disturbed area, review the existing reclamation plan, and agree upon any revisions to it.

c. All parts of the area unnecessary for long-term operations will be reshaped to blend with natural topography, covered evenly with topsoil and a seedbed prepared.
d. For cut-and-fill slopes, initial reclamation will typically consist of moving fill material back into cuts, back-filling and reshaping to achieve the configuration specified in the reclamation plan. Compacted areas will be well ripped in two passes at perpendicular directions. In fragile or loose soils, compaction techniques such as tread-walking may be necessary to prevent high erosion hazard. Topographic contours will be reshaped to blend with natural topography. These may include berms and swales to manage water drainage, support revegetation, mitigate visual impacts and maximize natural appearances.

MIN-57: Seedbed Preparation. Good seedbed preparation is key to soil stabilization, moisture infiltration, and improving the chances for revegetation success.

a. Following contouring, backfilled or ripped surfaces will be covered evenly with topsoil.
b. Within 24 hours of broadcast seeding, the spread topsoil will be roughened by a method such as pitting, raking or harrowing before seeding, to break up any crust that has formed and ensure good seed-to-soil contact.
c. To control erosion and enhance vegetative establishment on slopes steeper than 3:1, or to create a more natural looking landscape in areas of visual sensitivity, seedbed preparation may include pocking or pitting the soil material to form microbasins scaled to the site and materials. These microbasins will be constructed in irregularly spaced and irregularly aligned rows with an orientation perpendicular to the natural flow of runoff down a slope.
d. Requests to use soil amendments, including fertilizer and soil conditioners, will be submitted to the BLM for approval. Submittal will include basic information on the amendment and the purpose of its use.

MIN-58: Seed Mixes. Seed mixes will typically consist of native, early-succession species, or species with the ability to establish quickly in disturbed soil areas. Non-native species considered desirable under special circumstances, such as sterile non-native grasses will be submitted to the BLM for approval before use.

a. Seed mix composition will be calculated based on the number of Pure Live Seed per pound rather than percentage by weight. Seeding rate in pounds per acre will be based on the total number of Pure Live Seeds per square foot.
b. Weed free seed will be used. It will contain no noxious, prohibited, or restricted weed seeds and no more than 0.5 percent by weight of any other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. To maintain quality, purity, germination, and yield, only tested, certified seed for the current year, with a minimum germination rate of 80 percent and a minimum purity of 90 percent will be used unless otherwise approved by BLM in advance of purchase. Seed shall be viability-tested in accordance with State law(s) and within nine months before purchase.
c. Seed mixes for temporary use may contain one or more sterile hybrid grasses or other non-native cover crop in addition to native perennial species, if pre-approved by BLM.
d. For private surfaces, BLM-approved seed mixes will be recommended, but the surface landowner has ultimate authority over the seed mix to be used in reclamation.

e. Seed tags or other official documentation of the seed mix will be supplied to the BLM for approval at least 14 days before the date of proposed seeding. Seed that does not meet the above criteria will not be applied to public lands. A Sundry Notice describing the completed work, the weed-free certification, and the seed tag(s) will be submitted BLM within 30 days after seeding.

MIN-59: Seeding Procedures:

a. Seeding will be conducted no more than 24 hours following completion of final seedbed preparation (see Seedbed Prep).
b. Where practical, seed will be planted by drill-seeding to a depth of 0.25 to 0.5 inch along the contour of the site. Drill seeding will be followed by culti-paction to enhance seed-to-soil contact and prevent losses of both. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover. Hydro-seeding and hydro-mulching may be used in temporary seeding or in areas where drill-seeding or broadcast-seeding/ raking are impracticable. Hydro-seeding and hydro-mulching must be conducted in two separate applications to ensure adequate seed-to-soil contact.
c. If interim revegetation is unsuccessful, reseedings will be repeated annually until satisfactory vegetative cover has been achieved. Requirements for reseeding of temporary areas will be considered on a case-by-case basis. Seeding will be considered successful when the site is protected from erosion and revegetated with a vigorous, self-sustaining, and diverse cover of native (or otherwise approved) plant species. BLM shall not require reseeding during periods that have proven less than optimal.

MIN-60: Mulch:

a. Mulch will be applied within 24 hours following completion of seeding. Where areas have been drill- or broadcast-seeded and raked, certified weed-free straw or certified weed-free native grass hay mulch will be crimped into the soil. Hydro-mulching may be used in areas of interim reclamation where crimping is impractical, in areas of interim reclamation that were hydroseeded, and in areas of temporary seeding regardless of seeding method.
b. Mulch will not be applied in areas where erosion potential necessitates use of a biodegradable erosion-control blanket (straw matting).

MIN-61: Cut and fill slopes will be protected against erosion by contour grading, microbasins or other measures approved by the BLM. Well anchored BMPs such as biodegradable matting, weed-free bales or wattles may also be used on cut-and-fill slopes and along drainages to protect against soil movement.

MIN-62: The reclaimed pad will be protected from disturbance by a fence to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. Seeded species will be considered firmly established when perennial grass and forb species are at least 80% cover of that of the surrounding or reference area.

MIN-63: Monitoring. Because weed and reclamation management activities are components of a long-term process, monitoring and reporting are integral to and long-term commitment to land health.

a. All sites considered as "operator reclamation in progress" will be routinely monitored for reclamation success. Reports will be submitted to the BLM by December 1 of each year. Annual reports will include whether accomplishment of objectives appears likely and of not, what corrective actions are proposed.
b. All sites will be routinely monitored for the presence of noxious weeds or other undesirable plant species as set forth in the joint BLM/US Forest Service Noxious and Invasive Weed Management Plan for Oil and Gas Operators. Pesticide Use Proposals will be approved by the BLM before application of herbicides. Annual weed monitoring reports shall be submitted to the BLM by December 1. They will include weed species found (listed by common names), total acres infested with weeds, total acres treated, treatment methods, and total pounds of active ingredient of pesticides applied. All Noxious Weed Inventory and Pesticide Application records for that year will be included with the report.

MIN-64: Visual Resources:

a. Every proposal will include a detailed, site-specific description and plan of how it will meet the VRM Class of the area where it is proposed. As much as possible all proposed features will be located and placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points.
b. To the extent practical, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. Cleared trees and rocks may be salvaged for redistribution over reshaped cut-and-fill slopes or along linear features.
c. Above-ground facilities will be painted a non-reflective natural color selected to minimize contrast with adjacent vegetation or rock outcrops. Colors may be specified by the BLM on a project-by-project basis.
d. Adaptive management techniques may be applied before or after construction to mitigate straight-line visual contrast effects of pad margins, cut and fill slopes, pipeline alignments or other cleared vegetation. This could include additional tree removal along contrasting edges, to create irregularly shaped openings or more natural-looking mosaic patterns, or treating surfaces to mitigate visual contrasts in color or surface texture.

Geophysical Exploration:

MIN-65: Specialized low surface impact equipment (wide- or balloon-tired vehicles, all-terrain vehicles) or helicopters may be used for activities in off-road areas to protect fragile soils and or other resource values.

MIN-66: Pre-mobilization inspection will be performed to insure that all construction equipment and vehicles are clean and free of weeds, weed seed, soil and vegetative material prior to moving onto public lands. Driving through or parking on noxious weed infestations will be avoided.

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MIN-67: The operator will co-locate multiple wells on well pads and use directional drilling to reduce the number of pads and roads.

MIN-68: The operator will use centralize completions to reduce the number of truck trips, expense, exhaust emissions and fugitive dust.

MIN-69: To minimize construction disturbance, truck traffic, dust and other impacts to air quality, soils and wildlife, centralized production facilities will be used for all natural gas liquids and produced water.

MIN-70: Telemetry will be used to remotely monitor producing wells and facilities to reduce vehicular traffic. During winter closures, unavoidable monitoring and or maintenance activities will be conducted between 9 a.m. and 3 p.m., to the extent practical.

Administrative / General and Planning:

MIN-71: To limit surface disturbance and associated impacts to natural resources, all actions will consider the character of the topography and landform. Deep vertical cuts, long or steep fill slopes and side cuts across steep slopes will be avoided. Rights-of-way will be shared, and structures and facilities will be grouped.

MIN-72: Drilling will be done with 'closed loop' systems as much as possible, particularly in areas where water resources are most vulnerable, including: soils mapped as alluvial, colluvial, and glacial deposits; near springs and perennial water sources; in important groundwater recharge areas; and within municipal watersheds.

MIN-73: Chemicals used in the fracturing process will be biodegradable, non-toxic, pH neutral, residual free, non-corrosive, non-polluting and non-hazardous in the forms and concentrations being used. Documentation in the form of Material Safety Data Sheets will be reviewed by operator for compliance prior to use and Material Safety Data Sheets will remain on site at all times such chemicals are present.

MIN-74: In municipal watersheds, the operator will develop and implement a Watershed Protection Plan. This plan will characterize baseline hydrologic and hydrogeologic conditions such as but not limited to: water chemistry, water quantity, groundwater flow patterns, connectivity between geologic formations, and communication between surface and groundwater. The operator will collaborate with all watershed stakeholders in development of the plan.

MIN-75: Adopt BMPs per the BLM and US Forest Service Noxious and Invasive Weed Management Plan for Oil and Gas Operators (BLM and US Forest Service 2007).

MIN-76: Incorporate BMPs and conditions of approval from the Final Programmatic EIS for Geothermal Leasing in the Western US, as applicable (BLM and US Forest Service 2008).

Pre-Construction

MIN-77: Pre-mobilization inspections will be performed to be sure that all construction equipment and vehicles are clean and free of soils, weeds, weed seed and vegetative material prior to moving onto public lands. Driving through or parking on noxious weed infestations will be avoided.

Construction:

MIN-78: Surface disturbing actions associated with development of fluid minerals will follow Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (commonly referred to as The Gold Book)(BLM 2007b).

MIN-79: Where feasable, entrances to construction locations will be covered by gravel "track pads" to prevent sediment and weed seeds from being tracked in and out of the site.

MIN-80: In areas of mapped Mancos Shale, saline soils, or fragile soils, groundwater will not be discharged to surface water drainages, to minimize mobilization and transport of selenium, salts and sediment within the Colorado River Basin.

MIN-81: Where linear disturbance is proposed, edges of vegetation removal will be 'feathered,' to avoid long linear habitat edges and support habitat complexity for wildlife. Additional trees will be removed along such edges to create irregularly shaped openings and more natural mosaic habitat.

MIN-82: Cleared vegetation smaller than four inches in diameter will be stockpiled, shredded, and salvaged with topsoil. Cleared vegetation larger than four inches in diameter will be scattered over disturbed areas to accomplish reclamation objectives. Excessive vegetation larger than four inches in diameter may be removed from public land or shredded in place to be salvaged with topsoil. A wood cutting permit will be purchased from BLM for material removed from the site.

MIN-83: Windrowing of Topsoil. *[Use where appropriate based on topography – may not be appropriate for pads in steep areas or where pad size should be minimized.] T*opsoil shall be windrowed around the perimeter of surface disturbance to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil. Topsoil shall also be windrowed, segregated, and stored along disturbed surfaces or linear features for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.

MIN-84: Cattle guards will be installed and maintained whenever access roads intersect existing gates or fences.

Drilling:

MIN-85: Catalytic converters will be installed on all internal combustion engines to minimize emissions to Tier 3 levels.

MIN-86: Hazardous substances will not be used in drilling, testing, or completion operations, nor introduced at any time into the reserve or cuttings pit.

Utilization and Production:

MIN-87: Secondary containment shall include a study corrugated metal wall to create a basin, be lined with a heavy impervious poly liner and be protected with a gravel surface. Small hoppers or drip pans shall be installed at all loadout connections to catch drips and small leaks.

MIN-88: When special resource values are at risk, such as crucial wildlife areas, companies controlling access into these areas will gate and lock roads or restrict use to authorized users.

MIN-89: Speed control measures will be in place on all project related unpaved roads to reduce fugitive dust.

MIN-90: Use enclosed tanks instead of open tanks or pits to reduce fugitive VOC emissions.

MIN-91: Use vapor recovery units on oil, condensate, and produced water storage tanks to reduces fugitive VOCs and recovers BTU-rich vapors for sale or use on site.

MIN-92: Use and maintain proper hatches, seals, and valves to minimize VOC emissions.

MIN-93: Optimize glycol circulation and Install Flash Tank Separator (FTS) to capture methane and reduce VOC emissions on glycol dehydrators.

MIN-94: Replace wet seals with dry seals in centrifugal compressors. Centrifugal wet seal compressor emissions from the seal oil degassing vent can be reduced by the replacement of wet seals with dry seals that emit less methane and have lower power requirements.

MIN-95: Reduce gas leaks and emissions from reciprocating compressors by the economic replacement of rod packing at frequent intervals.

MIN-96: Reduce methane and VOC emissions by installing or replacing high-bleed pneumatic devices with low-bleed pneumatic devices.

MIN-97: Reduce methane emissions by installing plunger lifts and smart automation systems which monitor well production parameters.

MIN-98: Implement a Direct Inspection & Monitoring Program which identifies and cost effectively fixes fugitive gas leaks using Leak Detection, Infrared Camera, Organic Vapor Analyzer, Soap Solution, Ultrasonic Leak Detectors, Measurement, Calibrated Bagging, Rotameters, and/or High Volume Samplers.

Site Stabilization, Reclamation and Monitoring:

MIN-99: During interim reclamation contour land forming will be used to create a visual barrier to the permanent structures location on the site.

MIN-100: Re-topsoil and revegetate access road cut & fill slopes, backslopes and road shoulders, and borrow ditches. Also, revegetating the travel surface of surfaced roads and turnarounds, where practical. With low traffic roads, this will result in a hardpan, two-track road that is stable and requires less maintenance.

Solid Minerals:

MIN-101: Encourage disposal of salable minerals (such as moss rock, top soil, sand and gravel, scoria, fill dirt) primarily from established common use areas.

References:

BLM. 2012. H-9113-1 Road Design Handbook. Bureau of Land Management, Washington, D.C. On-line: http://web.blm.gov/nstc/eat/pdf/Final%20H-9113-1.pdf

_____. 1992. Handbook H-3042-1: Solid Minerals Reclamation. Release 3-275. BLM, Washington, DC. February 2, 1992. 104 pp.

_____. 2002. Handbook H-3600-1: Mineral Materials Disposal. Release 3-315. BLM, Washington, DC. February 22, 2002. 171 pp.

_____. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development – The Gold Book. BLM/WO/ST-06/021+3071/REV 07. BLM, Denver, CO. 84 pp.

_____. 2008. Record of Decision, Programmatic Environmental Impact Statement for Geothermal Leasing in the Western United States – Appendix B. BLM Washington Office. December 2008.

RENEWABLE ENERGY

REN-1: Authorize rights-of-way by applying appropriate BMPs from the BLM Record of Decision for Implementation of a Wind Energy Development Program (BLM 2005), land use restrictions, stipulations, and mitigation measures.

References:

BLM (United States Department of the Interior, Bureau of Land Management). 2005. Record of Decision for Implementation of a Wind Energy Development Program and Associated Land Use Plan Amendments. BLM, Washington, DC. December 15, 2005.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

ACEC-1: Aggressively control invasive and noxious weeds using integrated weed management methods consistent with protection of the relevant and important values.

ACEC-2: Allow vegetation treatments if they are determined to maintain or enhance the identified relevant and important values.

TRANSPORTATION AND ACCESS

TRN-1: Continue coordination with counties and other agency road entities to promote utilization of best management practices for road maintenance they perform within CRVFO boundaries. Maintain an inventory of existing road and trail systems.

TRN-2: BLM Manual 9113, Roads (BLM 2012) and BLM Handbook 9113-2, Roads – Inventory and Maintenance (BLM 2012) will be used to guide all maintenance and road construction designs and requirements. Include definitions for functional road classification and maintenance levels for BLM roads.

TRN-3: All highway rights-of-way and other road authorizations will contain noxious and invasive weed stipulations that include prevention, inventory, treatment, and revegetation or rehabilitation. Road abandonment will include at least three years of post-abandonment monitoring and treatment.

TRN-4: All travel management decisions will concur with the Bureau of Land Management, Colorado River Valley Field Office travel management planning.

TRN-5: In order to ensure public access and safety, the CRVFO shall continue an active road maintenance program employing the use of redesign, blading, brush removal for sight distance as appropriate, scarification, graveling, water barring, low water crossings, spur ditching, seeding and installation/cleaning of culverts.

TRN-6: NEPA Requirements – No new NEPA analysis will be required for road maintenance activities within the defined maintenance disturbance/easement footprint, which is defined as previously disturbed or maintained. Disturbance outside of the defined maintenance disturbance/easement footprint or road realignment will be subject to additional NEPA compliance.

References:

BLM. 2012. H-9113-1 Road Design Handbook. Bureau of Land Management, Washington, D.C. On-line: http://web.blm.gov/nstc/eat/pdf/Final%20H-9113-1.pdf_BLM.

RECLAMATION

The objectives of interim reclamation are to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize loss of habitat, forage, and visual resources.

The long-term objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, standards will be enforced to meet objectives for site stability, visual quality, hydrological function, and vegetative productivity.

Fluid Minerals:

R-1: Apply the Draft Template for the Northwest District Surface Reclamation Planning for Oil and Gas Operations Objectives and Performance Standards.

Reference:

Bureau of Land Management (BLM). 2012. Plans for Reclamation of the Surface Draft Template Northwest District. [Online]. Website: http://www.blm.gov/style/medialib/blm/co/field_offices/white_river_field/Documents.Par.80559.File.dat/Reclamation%20Plan%20Template%20-%20Draft%205-10-12.pdf. [Last update September 21, 2012].

General:

RCM-1: A reclamation plan will be provided to the BLM with the original proposed action or when activities are needed. Reclamation plans will discuss interim and final reclamation activities. The plan will include provisions for

a. Reclamation Timeline

b. Pre-disturbance Planning recommendations if applicable
c. Vegetation Monitoring Plan
d. Stabilization and Stormwater
e. Dust Abatement
f. Vegetation Clearing
g. Topsoil Management
h. Recontouring and Seedbed Preparation
i. Application of Topsoil & Revegetation
j. Fencing
k. Management of Invasive, Noxious, and Non-Native Species

RCM -2: Trees and vegetation will be left along the edge of surface disturbance whenever feasible to provide screening.

RCM -3: To help mitigate the contrast of recontoured slopes, reclamation will include measures to feather cleared lines of vegetation and to save and redistribute cleared trees, debris, and rock over recontoured cut and fill slopes.

RCM -4: To reduce the view of project facilities from visibility corridors and private residences, facilities will not be placed in visually exposed locations (such as ridgelines and hilltops).

RCM -5: Project facilities will be clustered and placed away from cut slopes and fill slopes to allow the maximum recontouring of cut and fill slopes.

RCM -6: All long-term above ground structures will be painted in a non-reflective finish to blend with the environment. Colors will be selected (from the BLM "Standard Environmental Colors") in the field at the proposed project location, considering viewer's likely observation points and the time of year with the greatest number of viewers. Selected colors will be one to shades darker than those naturally occurring in the background landscape.

RCM -7: Projects should be located to take advantage of existing vertical features, such as landforms or existing stands of vegetation to provide visually screening.

RCM -8: Projects should not be located in visually exposed locations, such as ridgelines and hilltops.

RCM -9: Projects should be located in areas that will minimize the amount of cut-and-fill needed to meet natural grade.

RCM -10: Linear disturbances (roads and pipelines) should follow the natural contours of the landscape as much as possible.

RCM -11: Project design should take into consideration any existing vegetation surrounding the project that can be used for visual screening. Care should be taken to preserve the integrity of the vegetation and the vegetation should remain standing and undamaged when the cut-and-fill slopes are recontoured.

RCM -12: Thinning and feathering of existing vegetation may also be used in areas where clearing within dense vegetation is required. Thinning and feathering will reduce the hard line between new construction and existing vegetation and will emulate the forms of natural clearings.

RCM -13: Project facilities should be placed to maximize recontouring of the cut-and-fill slopes and interim reclamation. Facilities should be oriented in the direction that is least visually obtrusive and should be clustered to reduce the overall impact and the area that will need to be visually mitigated. Facilities should be located away from the cut-and-fill slopes and, if possible, near a road to maximize the total surface area that can be reclaimed.

RCM -14: Cut-and-fill slopes should be recontoured to the approximate original contour or consistent with the adjacent topography so that the reclaimed landscape features blend into the natural surroundings.

RCM -15: Berms may be utilized to provide visual screening, but should be used only when it makes sense when viewing the surrounding natural environment and should blend with the adjacent topography.

RCM -16: Cleared vegetation and rocks salvaged during construction should be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features to emulate the color and texture closer to that of the natural landscape and to help create microclimates to encourage vegetation growth. The material should be placed so that it appears to be naturally deposited.

References:

BLM (United States Department of the Interior, Bureau of Land Management). 1985a. BLM Manual 9113: Roads. Release 9-247. BLM, Washington DC. June 7, 1985. 83 pp.

_____. 1985b. BLM Handbook 9113-2, Roads – Inventory and Maintenance. Release 9-250. BLM, Washington DC. December 19, 1985. 18 pp.

CONSERVATION MEASURES FOR FEDERALLY-LISTED SPECIES

The following conservation measures would be considered as standard operating procedures/processes/considerations for protection of species listed as threatened or endangered under the Endangered Species Act to help fulfill BLM's obligations under Section 7 of the Endangered Species Act.

Fluid Minerals:

T&E-GEN-1: The CRVFO will consult agency species management plans and other conservation plans as appropriate to guide management and devise mitigation measures when needed. Examples of these plans include, but are not limited, to the Colorado Wildlife Action Plan, Colorado Sagebrush: A Conservation Assessment and Strategy, National, range-wide, statewide and local working group conservation plans for Gunnison and greater sage grouse, Sharing the land with pinyon-juniper birds, Birds in a sagebrush sea: managing sagebrush habitats for bird communities, North American Landbird Conservation Plan, North American Waterbird conservation Plan, National and Colorado Partners in flight Bird Conservation Plans, Colorado Gunnison's and White-tailed Prairie Dog Conservation Strategy and Recovery plans for federally listed species, and the Colorado Rare Plant Conservation Initiative's Recommended Best Management Practices for Plants of Concern.

T&E-GEN-2: Application of BMPs in Instruction Memorandum No. 2013-033. This IM addresses BMPs for reducing the risk of direct wildlife mortality from the following five fluid mineral practices:

6. Open Pits and Tanks Containing Freestanding Liquids;
7. Chemical Tank Secondary Containment;
8. Pit, Tank, and Trench Entrapment Hazards;
9. Exhaust Stacks; and
10. Wire Exclosure Fences for Well Pads or Production Facilities and Associated Rights-of-way.

<u>Federally-Listed Plant Species:</u>

General:

T&E-PLT-1: Surface disturbances (including wildfire and prescribed fires) within potential habitat for listed or proposed plant species (i.e. salt desert shrub and Wyoming big sagebrush habitat west of Rifle) should review the need for cheatgrass control and/or seeding. Seeding should emphasize locally-adapted native species (or locally collected ecotypes, when available) that will not outcompete the special status plants.

T&E-PLT-2: Prior to approving any ground-disturbing activities, suitable habitat[1] for special status plants will be identified based on existing plant location records, soil or geological mapping, aerial photos, and/or site inventories. In areas identified as suitable habitat, surveys for special status species will be performed prior to conducting any ground disturbance. Surveys will take place when the plants can be positively identified, usually during the appropriate flowering periods. Surveys will be performed by qualified field botanists/biologists who will provide documentation of their qualifications, experience and knowledge of the species prior to starting work.

T&E-PLT-3: For Colorado hookless cactus and other federally listed, proposed or candidate plant species, surface-disturbing activities will be avoided within 200 meters of occupied plant habitat[1] wherever possible and where geography and other resource concerns allow[2]. Fragmentation of existing populations and identified areas of suitable habitat will be avoided wherever possible.

T&E-PLT-4: Where development is allowed within 100 meters of occupied habitat for listed, proposed, candidate or BLM sensitive species, unauthorized disturbance of plant habitat will be avoided by on-site guidance from a biologist, and by fencing the perimeter of the disturbed area, or such other method as agreed to by the Fish and Wildlife Service. In such instances, a monitoring plan approved by the Service will be implemented for the duration of the project to assess impacts to the plant population or seed bank. If detrimental effects are detected through monitoring, corrective action will be taken through adaptive management.

T&E-PLT-5: Surface disturbance closer than 20 meters to a listed plant will be considered an adverse effect. Mitigating measures within this narrow buffer are very important and helpful to individual plants, but we do not expect that all adverse effects can be fully mitigated within this distance. Some adverse effects due to dust, dust suppression, loss of pollinator habitat, and toxic spills will likely remain. There are two possible exceptions to this rule of thumb: 1) The new disturbance is no closer to a listed plant than preexisting disturbance and no new or increased impacts to the listed plant are expected; or 2) the listed plant is screened from the proposed disturbance (e.g., tall, thick vegetation or a berm acts as a screen or effective barrier to fugitive dust and other potential impacts).
T&E-PLT-6: Transplantation of potentially affected plants will not be used as a rationale to defend a "not likely to adversely affect" or a "no effect" determination for listed plant species.

T&E-PLT-7: Protect pollinator species for endangered or threatened species by incorporating the standard operating procedures found in the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

Travel Management:
T&E-PLT-8: When not needed for other resource uses, close and reclaim roads that are directly or indirectly impacting special status plant species to minimize disturbance, habitat fragmentation, and loss of pollinator habitat.

Weed Management:
T&E-PLT-9: All weed management actions will comply with the Conservation Measures from the Biological Assessment for the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (June 2007).

Wildland Fire Management:
T&E-PLT-10: Within mapped occupied and suitable habitat for Colorado hookless cactus, DeBeque phacelia or Parachute penstemon, wildland fire management actions will be conducted in the following manner:

- Minimize surface disturbance by using retardant, water, engines/wet lines, etc in known habitat rather than dozers or hand crews.
- Unless firefighter safety is jeopardized, construct fire line outside the perimeter of known cactus populations.

- Avoid cross-country use of motorized vehicles and mechanical equipment within known populations of federally listed or proposed plants.

Federally-Listed Fish Species:

T&E-AQU-1: Utuilize boring techniques to place pipelines used to convey anything other than fresh water under the Colorado River from the Highway 13 bridge crossing in Rifle, Colorado downstream to the Field Office boundary.

T&E-AQU-2: Use double-walled pipe and the placement of automatic shut-off valves on pipelines crossing the Colorado River to help reduce risk of effects associated with potential pipeline breaks or leaks.

T&E-AQU-3: Avoid drilling for fluid minerals in critical habitat for ESA listed fish (Colorado River and its 100-year floodplain from the Highway 13 Bridge crossing downstream to the Field Office boundary. If avoidance is not possible, use Closed Loop Drilling practices to eliminate the need for a reserve pit.

T&E-AQU-4: BLM will continue to abide by the Programmatic Biological Opinion (PBO)(ES/GJ-6-CO-08-F-0006), and (PBO)(#ES/GJ-6-CO-08-F-0010) for Colorado River water depletions. For emerging technologies such as Horizontal Drilling, the CRVFO will individually track water use associated with this drilling methodology and account for and report all water used.

T&E-AQU-5: As a member of the greenback cutthroat trout recovery team, BLM will continue to monitor and improve habitat, and work cooperatively with partner agencies to remove the threatened greenback cutthroat trout from the list of Threatened and Endangered Species.

Wildland Fire Management:

T&E-AQU-6: Avoid the dropping of fire retardant or foam within 300 feet of all water bodies and avoid locating staging, fire retardant chemicals, refueling sites, or other chemicals within 300 feet of water bodies.

T&E-AQU-7: Coordinate fire line placement and construction with resource advisors/fish biologists/hydrologists to minimize erosion potential, and rehabilitate constructed fire lines where erosion potential is high.

Federally Listed Terrestrial Wildlife Species – Canada Lynx:

General:

T&E-TER-1: Implement applicable conservation and restoration measures identified in the *Canada Lynx Conservation Assessment and Strategy* (Ruediger et al. 2000) as revised.

T&E-TER-2: Increase the permeability of the I-70 corridor for wildlife migration by providing long-term protection and restoration of Canada lynx linkages as per "A Landscape Level Inventory of Valued Ecosystem Components" (ALIVE) Memorandum of Understanding.

T&E-TER-3: Mitigate projects or actions that lead to a loss of connectivity within mapped Canada lynx linkage areas.

T&E-TER-4: Utilize the Southern Rocky Mountain Section 7 Lynx Project Decision Screen Conditions, Criteria and Operating Instructions to facilitate and streamline section 7 consultations for projects and activities the agencies agree are Not Likely to Adversely Affect (NLAA) the Canada lynx on Public Lands in the Southern Rockies. This process is intended to assist in the consistent application of information from the Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000), the Science Report (Ruggiero et al. 1999), and new science that has emerged since the LCAS, and in reaching effects determinations, and to provide efficient section 7 processing of NLAA projects.

T&E-TER-5: Consult with Colorado Parks and Wildlife (CPW) regarding lynx use and report all lynx sightings to CPW.

T&E-TER-6: Avoid locating facilities within lynx breeding habitat (spruce-fir forest above 9,000 feet in elevation and with slopes greater than 25%).

T&E-TER-7: Prior to development, establish baseline vegetation condition and inventory and to provide a basis for post-development habitat restoration.

T&E-TER-8: Identify, avoid, and protect vegetation used by snowshoe hares.

Wildland Fire Management:
T&E-TER-9: Wildland fire management within mapped potential Canada lynx habitats will be performed in a manner consistent with conservation measures outlined in the Canada Lynx Conservation Assessment and Strategy - Chapter 7 – Pages 7-6, 7-7 and 7-8. Considerations include:

- Attempts will be made to keep linear openings (fire line, access routes and escape routes) out of mapped potential habitat and away from key components such as denning areas.
- When managing wildland fire, minimize the creation of linear openings (fire line, access routes and escape routes) that could result in permanent travel ways for competitors and humans.
- Obliterate and reclaim linear openings (fire line, access routes and escape routes) associated with wildland fire management constructed within lynx habitat in order to deter future human and competitive species use.
- Avoid constructing permanent firebreaks on ridges or saddles in lynx habitat.

Fluid Minerals:
T&E-TER-10: Apply stipulations during programmatic planning stage for oil and gas that limit occupancy, control surface use or control timing of activities in lynx habitats.

T&E-TER-11: Utilize remote monitoring of sites that are located in lynx habitat, to reduce disturbance from well visitation.

T&E-TER-12: Establish company guidelines to minimize wildlife mortality from vehicle collisions on roads.

T&E-TER-13: Minimize traffic in occupied lynx habitat between 3:00 p.m. and 7:00 a.m.

T&E-TER-14: Reclaim newly constructed pipelines immediately following construction and do not allow any motorized vehicles access to pipeline (i.e., install barriers, boulders etc.).

T&E-TER-15: Encourage developers to pipe produced water to a central site for transport, in order to reduce truck traffic to each well pad site.

T&E-TER-16: Minimize upgrading of roads used to access oil/gas developments or transmission pipelines in lynx habitat or linkage areas.

T&E-TER-17: Develop a reclamation plan (e.g. road reclamation and vegetation rehabilitation) for abandoned well sites to restore suitable habitat for lynx.

Travel Management:
T&E-TER-18: On projects where over-the-snow access is required, restrict use to designated routes.

T&E-TER-19: Close and immediately reclaim all roads that are redundant, not used regularly, or have been abandoned to the maximum extent possible to minimize disturbance and habitat fragmentation.

T&E-TER-20: Minimize snow compaction when authorizing and monitoring land use activities.

Federally Listed Terrestrial Wildlife Species – Western Yellow-billed Cuckoo:
T&E-TER-21: If suitable habitat for the federal candidate yellow-billed cuckoo (Coccyzus americanus) is identified, perform site-specific habitat improvement actions and apply conservation measures to land use authorizations.

Federally Listed Terrestrial Wildlife Species – Mexican Spotted Owl:
T&E-TER-22: If areas of suitable Mexican spotted owl habitat is identified, apply conservation measures specified by USFWS.

Federally Listed Terrestrial Wildlife Species – Mexican Spotted Owl:
T&E-TER-23: Coordinate with the CPW and USFWS for wolf management.

References:

Ruediger et al. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and UDSI National Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142 pp.

[1] Occupied habitat includes areas historically or currently supporting plants and/or soils containing a viable seed bank. Suitable habitat is defined as an area that contains or exhibits the specific components or constituents necessary for plant persistence, as determined by existing maps plus field inspection and/or surveys. It may or may not be occupied by plants or a seed bank. Potential habitat is defined as an area that satisfies the broad criteria of the species' habitat description. It is usually determined by preliminary in-house assessment.

[2] An avoidance buffer helps to minimize dust transport, weed invasion, unauthorized vehicular activities, chemical and produced-water spills; and helps to protect pollinator habitat.